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6 CRITICAL ITEM MANAGEMENT

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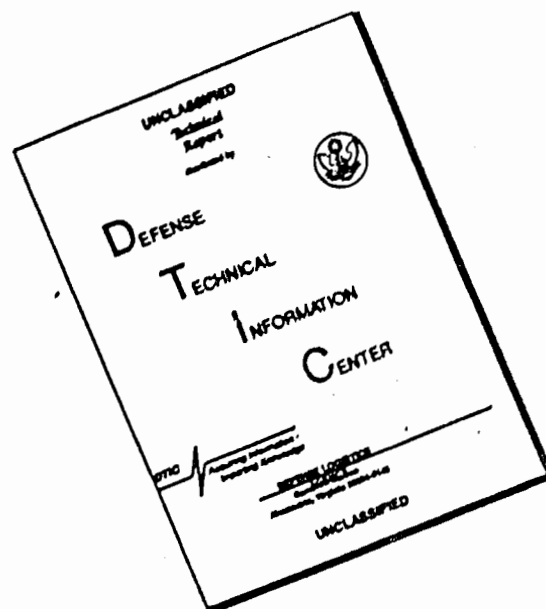
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DEFENSE LOGISTICS AGENCY

HEADQUARTERS
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ALEXANDRIA, VIRGINIA 22314

30 November 1977

IN REPLY
REFER TO

FOREWORD

In a memorandum dated 20 September 1976, the Assistant Secretary of Defense (Installations and Logistics) requested the Director, Defense Supply Agency to direct the Defense Logistics Analysis Office to conduct a review and analysis of Critical Item Management within DoD. The Study Plan, developed as a guide for conducting the review, lists these basic objectives:

- a. Identify when a supply item becomes "critical" and merits commensurate specialized management attention.
- b. Identify when a supply item is no longer "critical."
- c. Recommend methodologies for managing "critical items" of supply throughout the DoD.

The Study commenced with Service and Agency headquarters level briefings and a review of Department of Defense and Component issuances pertaining to intensively managed materiel. The Study continued with on-site research and data collection at various inventory control points. In addition, the Study Team received data reflecting Service intermediate levels of supply stocks of selected "Critical" or intensively managed items. The Study effort concluded with a series of analyses using the information accumulated by document research and briefings, and from data provided during on-site visits and submitted by Service field activities.

This Report contains the findings, analyses, conclusions and recommendations of the Study.

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TABLE OF CONTENTS

<u>Chapter</u>	<u>Page</u>
FOREWORD	i
TABLE OF CONTENTS	iii
LIST OF TABLES AND FIGURES	viii
I INTRODUCTION	1
A. Background	1
B. Study Objective	2
C. Study Scope	2
D. Study Team Composition	3
E. Study Approach	3
F. Data Collection	4
1. Item Data	4
2. Excess Materiel Data	5
3. Redistribution Data	6
G. Report Format	6
II SPECIAL ITEM MANAGEMENT SYSTEMS	9
A. Introduction	9
B. Army	10
1. General	10
2. The Selective Item Management System (SIMS)	11
3. Aviation Intensive Management Items (AIMI)	12
4. The Automatic Return Items (ARI) System	13
5. Field Operational Readiness Support Programs	14

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<u>Chapter</u>	<u>Page</u>
C. Navy	16
1. General	16
2. The Improved Repairables Asset Management (IRAM) Program	17
3. Fleet Operational Readiness Support Programs	21
D. Air Force	23
1. General	23
2. The Air Force Recoverable Assembly Manage- ment System (AFRAMS)	24
3. The Serialized Control and Reporting System (SCARS)	25
4. The Critical Item Program (CIP)	26
E. Marine Corps	30
1. General	30
2. Logistics Information System (LIS)	31
F. Defense Logistics Agency (DLA)	32
1. General	32
2. The Selective Materiel Management Program	33
3. The Weapon System Support Program (WSSP)	34
4. The Emergency Supply Operation Centers (ESOCs)	35
G. Analysis	37
1. Introduction	37
2. Item Management Systems	37
3. Operational Readiness Support Programs	40
4. Features of the Special Management Systems/Programs	42
H. Summary Observations and Conclusions	45
III CRITICAL ITEM DEFINITION	47
A. Introduction	47
1. Current Definitions and Interpretations	47
2. Use of the Definitions	47
3. Objective of this Chapter	48

<u>Chapter</u>		<u>Page</u>
	B. Characterization of Critical Items	48
	1. General	48
	2. Unit Price	49
	3. Annual Demand	50
	4. Consumable and Repairable Items	50
	5. Single and Multiple Application	51
	6. War Reserve Requirements	51
	7. Below Wholesale Level Allowances	52
	8. Summary	53
	C. The Current Definition	53
	1. General	53
	2. An Essential Item	54
	3. Short Supply	56
	4. Expected to Be in Short Supply for an Extended Period	57
	5. Summary	58
	D. Identifying Criticality	58
	1. Introduction	58
	2. The Essentiality and Urgency of Need Factors	59
	3. Asset Status	65
	4. Quantification of Critical Items	66
	E. Summary Observations and Conclusions	67
IV	MANAGEMENT ACTIONS FOR AVOIDING OR VOIDING CRITICAL ITEM STATUS	69
	A. Introduction	69
	B. Range of Actions Applied or Considered	69
	1. General	69
	2. Inventory of Actions	70
	3. Frequency of Application	71
	4. Effectiveness of Actions	72
	C. Application of Actions to Critical Items	73
	1. Avoiding Critical Item Status	73
	2. Filling Critical Item Requirements	76
	D. Summary Observations and Conclusions	79

<u>Chapter</u>		<u>Page</u>
V	SHARING DoD CRITICAL ITEM ASSETS	81
	A. Introduction	81
	B. Location of Resupply Stocks	82
	1. General	82
	2. Elements Holding Resupply Stock	82
	3. Summary	86
	C. Critical Item Asset Availability	86
	1. General	86
	2. Asset Availability	87
	3. Summary	91
	D. Critical Item Asset Knowledge	92
	1. General	92
	2. Current Status	93
	3. Required Improvements	95
	4. Summary	96
	E. Critical Item Asset Control	97
	1. General	97
	2. Current Management Authority	97
	3. Management Authority for Asset Control	97
	4. Mechanism for Asset Control	102
	5. Summary	104
	F. Summary Observations and Conclusions	105
VI	SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS	107
	A. Introduction	107
	B. Special Item Management Systems	108
	C. Critical Item Definition	110
	D. Management Actions for Avoiding or Voiding Critical Item Status	111
	E. Stocked Versus Nonstocked Items	113

<u>Chapter</u>	<u>Page</u>
F. Sharing DoD Critical Item Assets	113
G. Major Conclusions	114
H. Recommendations	115
Addendum VI-A, Proposed Department of Defense Directive, subject: Critical Item Management (CIM)	117
Addendum VI-B, Techniques to Effect Sharing . . .	121

Appendix

A. Study Assignment	127
B. Activities Visited	133
C. Activities Submitting Data for Critical Item Management Study	135
D. Determination of the Number of Critical Items as of 30 June 1977	139

LIST OF TABLES AND FIGURES

<u>Tables</u>		<u>Page</u>
III-1	Unit Price of Critical Items	49
III-2	Annual Demand of Critical Items	50
III-3	Consumable and Reparable Critical Items	50
III-4	Application of Critical Items	51
III-5	Critical Items With and Without War Reserve Requirements	52
III-6	Critical Items With and Without Allowances	52
III-7	Derivation of Priority Designators	62
III-8	Estimated Number of Critical Items as of a Point in Time	67

V-1	Critical Items With Resupply Stocks	88
V-2	Resupply Stocks of Critical Items Exceeding Computed Stock Levels (By Service)	88
V-3	Resupply Stock of Critical Items Exceeding Computed Stock Levels (By Reporting Activity)	89
V-4	Items Available at Activities Holding Resupply Stocks	90
V-5	Geographic Location of Resupply Stock of Critical Items	91

Figures

V-1	Resupply Stock Assets of Critical Items	100
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CHAPTER I

INTRODUCTION

A. BACKGROUND

The Department of Defense (DoD) definition of critical items provided in Joint Chiefs of Staff (JCS) Publication 1, "an essential item which is in short supply or expected to be in short supply for an extended period" has not served as a workable term for the DoD Components managing materiel. As a result DoD Components have adopted other definitions. Terms such as "selected items," "intensively managed items," or "very important items" are used within the various materiel management systems to identify specific supplies and equipment experiencing restricted availability or which may not be obtainable in sufficient quantity or quality to meet requirements.

The management concepts and systems within DoD for managing "critical item" resources are as varied as the definition of the terms. Some Components apply special management attention by the most experienced managers available to "essential items" with high annual dollar demand, and likely to be the subject of wide demand fluctuations and acquisition difficulties. Others intensively manage parts of their inventory for economic reasons. Unusually high unit cost items are managed most intensively to reduce supply inventory value without degrading operational readiness. Still others adopt organizations and systems that apply special techniques to manage items when "normal" materiel management actions had been exhausted and the continued lack of availability of the item places an unacceptable limitation on the operational capability of their supported units.

↙ The lack of consistency in designating "critical items" and the varied methodologies employed in managing such materiel within the DoD integrated materiel management environment necessitated this review. The identification of items now intensively managed, the degree of special management and the organizational level to which such management is extended need to be understood. However, since substantial numbers of operationally essential items are now managed by integrated managers it is necessary that greater consistency in designating and managing critical items in the DoD be achieved. To this end, this report presents a basic "critical item" definition, "critical item" selection criteria, and fundamental concepts for successful management of "critical items" of supply. ↗

B. STUDY OBJECTIVE

The plan for this review (Appendix A), forwarded by a 20 September 1976 memorandum from the Assistant Secretary of Defense (Installations and Logistics), established these specific study objectives:

"Develop standard criteria for identifying: (1) when an item of supply becomes 'critical,' and merits the specialized management attention associated with that designation; and (2) when an item of supply should no longer be managed as a 'critical item.'

"Develop a single uniform system for management of critical items, including but not limited to such areas as algorithms for critical item control levels, redistribution criteria, depth and frequency of inventory data reporting, data interchange requirements, specialized requisition processing, use of premium transportation, intensified maintenance management, and urgent procurement actions."

C. STUDY SCOPE

The review, findings, and recommendations apply to secondary items of supply as defined in DoD Instruction 4140.24, "Requirements Priority and Asset Application for Secondary Items," and under the wholesale management of the Services and the Defense Logistics Agency (DLA). Excluded from this review are bulk petroleum, communication security materiel, and classified materiel.

The scope of the materiel support systems under this review is worldwide. The levels of supply identified for the review are wholesale as defined by the Joint Department of Defense Retail Inventory Management and Stockage Policy Working Group and resupply stocks as defined by the Study. Wholesale stocks are "inventories, regardless of funding source, over which an inventory manager at the national level has asset knowledge and exercises unrestricted asset control to meet worldwide inventory management responsibilities." Resupply stocks are assets positioned below the wholesale level in support of specific consumer units, activities, or geographic areas; they are not assets positioned for immediate end use.

"Critical item," "potential critical item," and "critical item management" in this review apply to those items which receive special management attention because of their supply status. This review is limited to the specialized management actions applied to items not available in sufficient quantity of acceptable quality to meet existing urgent requirements."

D. STUDY TEAM COMPOSITION

The Study Team consisted of three full-time logistics analysts from the Defense Logistics Analysis Office.

E. STUDY APPROACH

The Study effort commenced with a review of Department of Defense, Military Service and Defense Logistics Agency issuances pertaining to intensively managed materiel. This document study was followed by briefings and field research.

Headquarters level briefings were obtained from the Military Services and from the Defense Logistics Agency about their programs for intensified management of secondary items. Information from these briefings and background data provided by the Office of the Secretary of Defense indicated that each DoD Component responsible for materiel support has one or more special systems or programs, beyond its basic materiel management system, for recognition of serious or potentially serious materiel support situations.

The Air Force identified the only "Critical Item Program" within DoD. The other Components discussed systems for managing critical items, usually within a special management program such as "Selective Item Management" or "Intensive Item Management" systems. To identify critical items in this environment and means for managing such items it became necessary to review as many special item management programs as practical.

The current "critical item" definition encompasses two subsets of items: (1) "Critical Items" and (2) "Potentially Critical Items." The former subset includes items that are in a poor asset status causing severe support problems; the latter subset includes a much broader range of items for which support trouble can be expected unless certain management actions are effected.

Recognition of these factors had a significant impact on the study approach and influenced the field research, the data collection, and the analysis.

Subsequent to development of a research outline and statistical data requirements, in-depth field research began. Representative Continental United States (CONUS) Inventory Control Points (ICPs) of the Military Services and the Defense Logistics Agency were visited. A list of field activities visited is contained in Appendix B. The objective of the on-site research was to learn the field interpretation of issued policy and observe the various special materiel management organizations and practices.

Based on analysis of the information collected through document research and briefings, data provided during on-site visits, and data submitted by the Services, this report was developed.

F. DATA COLLECTION

1. Item Data

To develop a characterization of a critical item and determine the management actions taken by item managers to satisfy backordered Not Operationally Ready Supply (NORS) type requirements and requirements for "critical items," two data samples were collected during field research. One sample, referred to as the Team Sample, consists of supply items having NORS backorders and no on-hand serviceable assets at the wholesale level. The second sample, referred to as the ICP Sample, was collected in two ways. At the Army, Missile Readiness Command (MIRCOM); the Navy, Ships Parts Control Center (SPCC); the Aviation Supply Office (ASO); and the Marine Corps Logistics Support Base, Atlantic (MCLSBA), item managers provided items for examination that were contributing most to degraded support of customers. The Army Troop Support and Aviation Readiness Command (TSARCOM); the Air Force, Air Logistics Center, San Antonio (SAALC); and the Defense Logistics Agency, Defense Industrial Supply Center (DISC), provided for examination items included in Component special materiel management systems because of support problems. Data collected on items in each sample were:

- a. National Stock Number (NSN)
- b. Nomenclature
- c. Unit Price
- d. Managing ICP
- e. Requirements Methodology
- f. Consumable or Repairable
- g. Annual Demand Quantity
- h. Single or Multiple Application
- i. Whether Allowances Exist Below Wholesale Level
- j. Single or Multiple Procurement Sources

- k. Administrative Leadtime
- l. Production Leadtime
- m. Repair Facility and Repair Cycle Time
- n. Authorized Wholesale Stockage Levels
- o. Asset Status
- p. Control Levels
- q. NORS Requirements and Quantities on Backorder of Oldest NORS Backorder
- r. Management Actions Taken to Satisfy Urgent Requirements

The data was collected using a combination of item manager interviews and management tools available to the manager such as supply control studies, and related manual and mechanized supply management system output.

NUMBER OF ITEMS IN EACH SAMPLE BY ICP

<u>ICP</u>	<u>Team Sample</u>	<u>ICP Sample</u>
MIRCOM	48	38
TSARCOM	43	47
SPCC	14	14
ASO	38	27
SAALC	47	63
MCSLBA	27	20
DISC	<u>45</u>	<u>52</u>
Total	262	261

2. Excess Materiel Data

To determine whether or not supply items managed intensively by wholesale managers or having backordered urgent NORS type requirements were being disposed of as excess, the 523 items reviewed during field research were screened against Defense Automatic Addressing System Office (DAASO) files to extract any reports of excess and ICP responses over a 90 day period (1 March - 31 May). DAASO provided matched transactions for review.

Two hundred twenty-six sample items were the subject of one or more excess or response to excess report transactions. There were 517 excess reports with no corresponding responses, 264 excess report responses with no corresponding excess reports and 658 excess reports with corresponding responses from the wholesale manager.

3. Redistribution Data

To identify whether or not items with stock in short supply at the wholesale level were also in short supply at elements holding resupply stocks, 471 of the 523 items selected during field research were screened against the inventory records of certain Service field activities. Fifty-two DLA Very Important Program (VIP) items were removed from the sample prior to the Service unit screen because the VIP items had no backorders; hence, it was expected that assets were available at field activities normally holding resupply stocks of VIP designated items. The field activities, listed in Appendix C, were selected by the Services as representative of each Service's elements holding the resupply stocks. These NSNs were then screened against existing inventory. For each sample item with a local matching inventory record the activities submitted the following data:

- a. Serviceable On-hand Quantity
- b. Reorder Point Quantity
- c. Requisitioning Objective
- d. War Reserve Authorized Quantity
- e. War Reserve Stock On-hand Quantity
- f. Other Authorized Reserve Levels
- g. Condition Code
- h. Purpose Code

Data were assimilated by computer producing several reports from which the statistics in Chapter V were extracted.

G. REPORT FORMAT

The findings, discussions, analyses, observations, conclusions and recommendations are presented in the following sequence:

Chapter II is an overview of the principal special management programs being used by DoD Components to augment their basic wholesale materiel management systems or to identify materiel readiness problems.

Chapter III portrays various management problems associated with the current DoD definition for "critical items." It reviews the elements of critical item designation, presents a critical item definition and provides an estimate of the number of critical items in the DoD inventory based on the new definition.

Chapter IV describes materiel management actions taken at the wholesale level to satisfy urgent requirements when on-hand materiel is at or forecasted to reach a zero stock state before the next scheduled replenishment.

Chapter V discusses a program and requisites for sharing critical item resupply assets located at activities below the wholesale level among Service customers.

Chapter VI summarizes the Study's findings, analyses, and conclusions, and sets forth the Recommendations of the Report.

CHAPTER II

SPECIAL ITEM MANAGEMENT SYSTEMS

A. INTRODUCTION

The Department of Defense Logistics System is expected to provide materiel support to the Military Service operating forces under conditions of peace and war, as economically as possible. The total System is composed of many subsystems managed by several Components and over forty inventory management activities having responsibility for a wide range of materiel to support a wide range of customers. Certain systems and subsystems are constantly changing, sometimes to accommodate sophisticated new weapons systems and to take advantage of new management technology and, on occasion, to overcome specific support problems or systems deficiencies.

This Study is oriented toward identifying and seeking solutions for the most serious logistics system support problem or system deficiency — the critical item situation — wherein the asset status of an item of supply has an adverse impact on essential mission accomplishment.

Office of Secretary of Defense (OSD) background data leading to this Study and initial headquarters level briefings for the Study indicated that each Department of Defense (DoD) Component responsible for materiel support has one or more special systems or subsystems, beyond its basic materiel management systems, for recognition of serious and potentially serious materiel support situations. Among the special materiel management systems, subsystems and programs identified were those designed to:

- Identify supply items contributing significantly to degraded readiness;
- Identify operational programs or equipments being adversely impacted by supply system failures;
- Improve use of assets and accommodate financial restraints; and
- Give optimum attention to categories of items having the greatest demands, consuming the greatest volume of resources, or indicating the greatest potential of becoming deficient.

Collectively, these special programs encompass the "selective" and "intensive" item management programs used by nearly all materiel managers, including those labeled critical item management programs by some materiel managers.

To identify critical items and means for managing such items, it was necessary to review as many special item management programs as practical. This Chapter, the result of that review, describes several of the special materiel management systems, subsystems and programs used by the Military Services and Defense Logistics Agency to apply special and preferential management techniques to supply items and inventories that impact on the readiness of operational equipment.

B. ARMY

1. General

Within the Department of the Army, wholesale materiel management is the responsibility of the U.S. Army Development and Readiness Command (DARCOM). Within DARCOM, item management is accomplished at subordinate Commands, each of which has responsibility for a range of materiel supporting a specific "commodity" area, such as Troop Support and Aviation materiel, Electronics materiel, and Missile materiel. They are:

- The U.S. Army Missile Readiness Command (MIRCOM)
- The U.S. Army Troop Support and Aviation Materiel Readiness Command (TSARCOM)
- The U.S. Army Armament Materiel Readiness Command (ARRCOM)
- The U.S. Army Tank Automotive Readiness Command (TARCOM)
- The U.S. Army Electronics Command (ECOM)

The basic system for performance of materiel management functions is the Army Commodity Command Standard System (CCSS). The CCSS provides the standard methodology for computing materiel requirements, displaying asset data, maintaining requisition and procurement history, providing cataloging and technical data, producing Materiel Release Orders, providing status to requisitioners and performing other day-to-day inventory control functions.

The CCSS also provides reports which are used for management purposes. One of these, the Eliminate Back Order Report (EBOR), is designed to identify stocked items experiencing zero balance, items with a potential zero balance, and organizations responsible for corrective materiel management action. Another

subsystem of the CCSS is the Operational Readiness Oriented Supply System (OROSS) which ranks each line item managed by each Army Inventory Control Point (ICP) by number of demands. The objective is to identify important items and potential problem items for selectively applied special management actions.

The basic materiel management organization and system, including subsystems, for maintaining readiness are influenced extensively by the characteristics, demand patterns, demand value, and procurement value of the items being managed.

To provide commodity managers with better asset knowledge for improved requirements forecasting and asset management, the Army uses vertical management techniques to provide intra-Army asset visibility and control over selected items. These special techniques have been incorporated into an overall Army-wide intensive materiel management program which includes selected secondary items representing about 60 percent of the dollar value of Army annual demands. The umbrella program for this special materiel management effort is the Selected Item Management System. This System, its primary subsystems, and principal supporting programs that will be described briefly in the following paragraphs are:

- The Selective Item Management System (SIMS),
- The Aviation Intensive Management Items (AIMI),
- The Army Automatic Return Item (ARI) System,
- The Missile and Rocket Equipment Report (RCS-139),
- The Materiel Assistance Designated (MAD) Report, and
- The Logistics Intelligence File (LIF)

2. The Selective Item Management System (SIMS)

a. Objective. The primary objective of SIMS and an updated version of SIMS (SIMS-X) is to provide Army managers with extended visibility and control of Army assets for selected items in a short supply or potentially short supply status.

b. System Description

SIMS addresses requirements, distribution, and storage policies and procedures for approximately 3,000 selected secondary

items, consumables and reparable, representing about 60% of the annual demand value for Army-managed secondary items. Items having annual demand value of \$50,000 or more are eligible for inclusion in the System.

For items selected, expanded visibility is attained through the monthly submission of Availability Balance File and Demand/Return History File data and the quarterly submission of Demand Summary File data to the Catalog Data Agency at New Cumberland Army Depot where they are processed and converted into reports for the various materiel managers. Ultimately, materiel managers receive reports showing: (1) worldwide assets, including those of Direct and General Support Units and (2) associated supply control studies showing potential net system requirements and excesses. Using these two products, the item manager can review incoming requisitions and identify candidates for restriction of issues or utilization of assets located below the wholesale distribution system.

The most extraordinary SIMS action permitted is issuance of referral orders by the wholesale manager to an echelon below the wholesale management level. Such action is used only when a reporting unit is identified with excesses or on-hand assets exceeding twice its requisitioning objective.

3. Aviation Intensive Management Items (AIMI)

a. Objective. The primary goal of AIMI is to provide worldwide asset visibility and expanded management control of selected Army-managed aviation program support items.

b. System Description

AIMI is an intensive materiel management program for approximately 125 items, including about 34 Aviation Component Intensive Management System (ACIMS) items and 91 aviation "critical short supply items." The ACIMS items are cost critical aircraft engines and other major reparable components for which serial number accounting is maintained. The additional "critical short supply items" include essential high value components and parts which because of their current or projected supply status could cause operational problems.

ACIMS' cost critical reparable are nominated by the Commander, TSARCOM and approved by the Department of the Army for inclusion in the System. Other AIMI items are selected by

TSARCOM or supported commands based on either high dollar (over \$500,000) value annual demand or the current or projected critical supply position of the item.

After an item is designated "AIMI," (1) asset reporting is extended beyond the wholesale level, (2) worldwide supply control studies are prepared quarterly, (3) semi-annual manager-user requirements review conferences are held to negotiate asset application, (4) requisitions are processed manually, (5) issues are tightly controlled, and (6) premium transportation is used.

The most extraordinary actions afforded AIMI items are those associated with issue restrictions of wholesale stocks and efforts to locate and redistribute assets below the wholesale level. As a result of the manager-user negotiations, firm support levels are developed for all customers. In those instances where insufficient assets are available, participants agree to use the few assets available to fill Not Operationally Ready Supply (NORS) requirements only and subsequently these are the only requisitions honored by the ICP. When wholesale stocks are depleted, assets below the wholesale level may be redistributed; however, this occurs primarily within the requiring major Army Command or with the approval of the Commander holding intermediate level assets.

4. The Automatic Return Items (ARI) System

a. Objective. The ARI System is designed to expedite return of recoverable reparable and potentially excess secondary items from operational Army elements to predesignated depots.

b. System Description

As of May 1977 there were approximately 5,000 items in the System. These items are included because wholesale item managers had indicated that the items met one or more of these criteria: (1) the item is "critical" because it is at a zero balance or a zero position is forecast; (2) the item is "critical" to the operation of an essential weapon system; or (3) the item has an annual procurement value in excess of \$5 million. Items designated ARI by commodity managers are reported to the Army Logistics Control Activity which publishes an ARI listing to Army commands each quarter.

Based on the ARI listings, field commanders return unserviceable reparable to predesignated Continental United States (CONUS) maintenance depots without requesting disposition

instructions. Unserviceable depot reparable, repair of which is beyond local capabilities, are returned regardless of condition and asset position. Other unserviceable reparable items are returned when they are beyond the maintenance capability of direct or general support unit repair resources; exceed the authorized levels of maintenance; or cannot be repaired within 120 days. ARI in a serviceable condition but excess to local retention levels are returned to the closest CONUS supply distribution depot (Sharpe, New Cumberland, or Red River Army Depots). ARI shipments are usually made using high priority shipment designators.

5. Field Operational Readiness Support Programs

a. Objective. In addition to the Intensive Materiel Management Programs operating within the SIMS framework, the Army has three programs to monitor logistics readiness of operational field elements. These programs are designed to identify materiel shortages or potential shortages, possible causes of the problem, and the management agent responsible for action. Each supplements and supports the basic and intensive item management systems of the Army.

b. The Missile and Rocket Equipment Report

The Missile and Rocket Equipment Report establishes a uniform reporting procedure for submitting Not Operationally Ready Supply and Anticipated Not Operationally Ready Supply (NORS/ANORS) reports for Army missile and rocket equipment. This report, identified as the RCS-139 Report, is designed to ensure that positive supply action is taken to satisfy these types of requirements for Army missile and rocket equipment.

Reports of systems failures are submitted daily by mail to the MIRCOC by the Direct Support Unit (DSU) or General Support Unit (GSU) Commander responsible for maintenance support. The first report informs the Missile Readiness Command that a missile system is deadlined. When needed repairs are determined, a change report is submitted identifying the required repair parts and whether they are available locally. If the parts are not locally available, the National Stock Number (NSN), requisition document number, nomenclature, issue priority designator, and quantity required for all items, regardless of who (the Army or another Component) manages the item, are provided Missile Readiness Command Managers. Military Standard Requisitioning and Issue Procedures (MILSTRIP) requisitions are submitted through

normal requisitioning channels to the appropriate wholesale manager. The Missile Readiness Command is advised by a second change report when the requisitioned parts are received. A final report is submitted when the parts are installed and the missile system is removed from deadline status.

RCS-139 Reports are received, keypunched, and used by the Missile Readiness Command to update and maintain a consolidated data base. The Command's personnel monitor the requisitions reported via the RCS-139 and attempt to expedite supply action where requirements processing exceed pre-established time standards. When items are managed by other Components, expedite action usually becomes a matter of negotiation. Missile Readiness Command personnel monitoring RCS-139 reported requirements are dependent on the other managers for supply status information.

c. The Materiel Assistance Designated (MAD) Report. The MAD Report is a three-part manual report submitted monthly by Army field commanders to advise higher command elements of assistance required to achieve their required logistics readiness posture. The Report is submitted through formal command channels on alternate months. Each part pertains to specific equipment types and covers a designated reporting period. Part I, listing Principal End Item (PEI) equipment shortages, contains data showing the required item: NSN, quantity authorized, quantity on-hand, and requisition number for shortages along with the latest status received from the reporting ICP; remarks to clarify shortages not requisitioned; identification of on-hand substitute items; and the readiness status of on-hand equipment. Part II, listing equipment status and outstanding NORS requisitions over 30 days old, contains requisition data grouped by wholesale supply source and includes: NSN, quantity, document number, weapon system designator code, and latest supply status. Units report only NORS requisitions for which no shipping status has been received. Part III lists other equipments having shortages and seriously degrading readiness or mission accomplishment.

d. The Logistics Intelligence File (LIF) and Reports

The LIF, located at the Logistics Control Activity, Presidio, California, is designed to receive images of MILSTRIP and Military Standard Transportation and Movement Procedures (MILSTAMP) documents sent via the Defense Automated Addressing System (DAAS), maintain status, conduct and respond to follow-ups and prepare performance reports on the supply and transportation of Army required materiel.

Reports produced from the LIF are designed to show order and shipping time, furnish requisitioners with the shipment status of their requisitions, and furnish information to higher headquarters on supply and transportation delays that could adversely affect supply support to Army requisitioners. The LIF contains intransit asset visibility for items determined to be critical in the Army inventory and is used as a means for inter-activity communications between overseas and CONUS GSUs and DSUs, intermediate levels of command, and CONUS suppliers.

A unique application of the LIF is the visibility afforded weapons system NORS and ANORS requisitions. Using the weapons system codes required on all Army NORS and ANORS requisitions, the LIF is able to provide demand data to weapons system managers by requisition and NSN. Open requisitions are identified weekly to system managers to assist in alleviating NORS conditions.

C. NAVY

1. General

To support the Naval operating forces worldwide, the Navy has a logistics command, the Naval Material Command (NAVMAT) commanded by the Chief of Naval Material (CNM). Five major subordinate commands of NAVMAT are responsible for Navy materiel management. They are:

- The Naval Sea Systems Command (NAVSEA)
- The Naval Air Systems Command (NAVAIR)
- The Naval Electronics Systems Command (NAVELEX)
- The Naval Facilities Engineering Command (NAVFAC)
- The Naval Supply Systems Command (NAVSUP)

Within the NAVMAT complex, the CNM has assigned the responsibility of supply system management and support to NAVSUP. Two NAVSUP-managed inventory control points, the Aviation Supply Office (ASO) and the Ships Parts Control Center (SPCC) manage over 95% of the Navy controlled items.

The basic materiel management system of the Navy has both centralized and decentralized features. Major procurement and distribution are managed and decisions are made centrally at the ICP. Materiel is placed at locations accessible to expected users and, to a large extent, requisition processing and stock control functions are decentralized.

Three "uniform, automated systems," the Uniform Automated Data Processing System for Inventory Control Points (UICP), the Uniform Automated Data Processing System-Stock Point (UADPS-SP), and the Shipboard Uniform Automated Data Processing System (SUADPS) provide the basic Navy-wide framework for performing materiel management. UICP provides standard programs and equipment for the two major Navy ICPs to accomplish basic wholesale inventory management functions. UADPS-SP provides Navy stock points with similar stock control procedures and interfaces with the UICP program. SUADPS provides Marine Aviation Groups and some ships a system for financial management, control of inventories, and collection of maintenance data.

In aggregate the three uniform systems provide the framework within which overall materiel support for Navy operational equipment is maintained. However, other special, supplemental programs for extended asset visibility, materiel control, and problem recognition have been developed and are being used. The special, intensive materiel management programs observed and described in the following paragraphs are:

- The Improved Repairables Asset Management (IRAM) Program,
- The Supply Selective Treatment and Review System (SUPSTARS), and
- The Aviation Supply Control Center (ASCC) System.

2. The Improved Repairables Asset Management (IRAM) Program

a. Objective. The overall objective of Navy IRAM programs is to improve management of reparable materiel to sustain support within a constrained financial environment by substituting intensive management to offset procurement and reduced inventory values. To do this, the programs have the following specific objectives:

- Maximize Carcass Returns by improving record keeping and follow-up with the end user to assure prompt return of carcasses with acceptable documentation;
- Minimize Repair Turnaround Times by identifying and eliminating delays, and maintaining an adequate stock of Ready For Issue (RFI) items to support requirements;

— Expedite Handling of RFI and Not Ready For Issue (NRFI) reparable items, i.e., reduce administrative time necessary to make repair decisions and process documentation, and reduce repair time by providing production incentives for repair facilities; and

— Exercise Positive Issue Control by requiring a carcass to be returned for each replacement issued (except initial issues and allowance increases).

b. System Description. IRAM includes two subprograms, the Fleet Intensified Repairables Management (FIRM), a program for intensive management of costly, high demand, critical ship-board reparable components; and the Closed Loop Aeronautical Management Program (CLAMP), a program for intensive management of aircraft related reparable components.

(1) FIRM

The FIRM Program is a dedicated semiautomated system using standard MILSTRIP and MILSTRAP procedures designed to control requisitions and monitor turn-in and turnaround performance for "critical" items managed primarily by the Ships Parts Control Center. As of mid-1977 the Navy had approximately 1,700 reparables designated for management within FIRM.

Items nominated for FIRM are reparables which are either in the inventory or new items which are being introduced through the provisioning process. In addition, the item must meet one or more of the following criteria: (a) have annual repair requirements costing more than \$50,000, (b) have an annual procurement cost greater than \$50,000, (c) be the cause of three or more Casualty Reports (CASREPTs) annually, (d) have requirements exceeding serviceable assets during repair cycle, (e) have a carcass return rate below the average for similar items, (f) have a repair cycle time greater than the average for similar items, or (g) be an item for which a fleet commander recognizes a critical situation or potentially critical situation.

SPCC indicated that FIRM items are all supporting critical fleet weapon systems, account for about 80% of the SPCC annual repair expenditures, and account for about 95% of the items experiencing three or more CASREPTs a year. Therefore, special, intensive item management is applied. Among the special item management techniques applied are:

— A FIRM Program Branch within the Stock Control Division of SPCC: (a) plans, coordinates, and provides long range direction for the SPCC FIRM reparable program; (b) establishes and coordinates funding and budget requirements, record maintenance, and preparation of FIRM Reports; and (c) maintains control over SPCC FIRM Designated Overhaul Point (DOP) representatives.

— Materiel Controls are modified to provide for (a) centralized, SPCC-item manager review of all requisitions; (b) the inclusion of special exception information (e.g., carcass turn-in and RFI asset data) on each requisition; and (c) stringent item manager materiel release control.

— Designated Overhaul Points (DOPs), both organic and contractor operated, are provided with specific guidelines for performing receipt, control, processing, and shipment actions on an expedited basis.

— Fleet Repairables Assistant Agents (FRAAs) at operating bases and stock points are provided with guidelines for expedited operating procedure for handling FIRM items.

— Asset Visibility below the wholesale level is established through the Cyclic Asset Reporting Procedures (CARP) reports. Each active ship reports on-hand designated item assets, on a quarterly basis, to SPCC.

— Item Status and Location Information is maintained through Transaction Item Reporting (TIR) procedures.

— Transportation for FIRM items is handled on a high priority basis.

(2) CLAMP

The CLAMP is a dedicated, semi-automated off-line system using Military Standard Transaction Reporting and Accounting Procedures (MILSTRAP) and a dedicated communications capability for the intensive management of critical, reparable materiel managed primarily by the Aviation Supply Office. As of mid-1977 there were approximately 9,000 reparable designated for management within CLAMP.

The basic selection criterion for CLAMP is that the items must be reparable components essential to the support of aviation program related weapon systems and equipment. Selections

are made generally by ASO and occasionally by a fleet commander and are approved by the Commander, Naval Air Systems Command. Mission essentiality is a key to selection and approval.

To attain the IRAM and CLAMP objectives, the program depends on (a) one-for-one exchange, (b) improved retrograde control, (c) enforced system discipline, and (d) identification of failure causes. In pursuit of these goals, CLAMP intensive item management techniques applied are:

- The Weapons Logistics Division of ASO is given specific responsibility for CLAMP administration and evaluation.
- Detailed Allowances are reviewed and negotiated by ASO and fleet users followed by a worldwide inventory and transfer of all excesses to a designated Wholesale Storage Site.
- Serial Number Controls are established to assure positive control of CLAMP items as they are processed throughout the system.
- Issues are monitored to assure a one-for-one exchange.
- Dedicated Storage Areas are maintained at both organic and contractor repair facilities.
- Dedicated Repair Capacity is established at organic and contractor facilities.
- ASO Item Managers review all materiel management decision transactions.
- ASO Field Representatives (AFRs) control the receipt, issue, and induction of CLAMP items at Wholesale Storage Sites. Those assigned to operating sites monitor one-for-one exchange procedures, maintenance practices, and insure that inventory control is maintained over all serviceable, unserviceable, and in-process CLAMP items.
- A Separate, Dedicated TWX (Western Union) communication system is used for transmittal of CLAMP transactions between CONUS CLAMP sites, contractors, and ASO.

— Transportation of CLAMP items is accomplished using high priorities.

3. Fleet Operational Readiness Support Programs

a. Objective. The Navy has at least two special programs to monitor fleet operational readiness and facilitate recognition of critical or potentially critical support situations. Each of these supplements the basic, uniform materiel management system of the Navy as well as the special, intensive item management programs. The primary objective of these programs is to recognize the critical support situation, identify the materiel shortages causing the problem, and expedite correction of the problem.

b. The Supply Selective Treatment and Review System

Within the Navy operating forces, CASREPTs are submitted by the Commanding Officer of a naval ship, craft, shore activity, or overseas base having a significant casualty, loss, or damage affecting mission essential equipment. The CASREPT system is the primary means of reporting the equipment readiness status of any reporting unit with a diminished combat readiness posture which involves inoperative or malfunctioning equipment and is a key element in the analysis and improvement of the Fleet materiel conditions.

For nonaviation materiel, the SUPSTARS monitors materiel support of requirements identified in Consolidated Fleet Casualty Reports. The system is semiautomated and has two key operating sites, the Naval Supply Centers (NSCs) Norfolk and Oakland, for monitoring, expediting, and reporting requisitions for selected nonaviation, NORS requirements. Included within this System are materiel requirements for all designated Atlantic and Pacific Fleet ships that submit CASREPTs. Requisitions for materiel to satisfy each CASREPT and their latest status are included in the SUPSTARS files of the NSC supporting the reporting ship's respective fleet area, i.e., Pacific ships - Oakland and Atlantic ships - Norfolk. Requisition and status input to these files is transmitted as transaction images processed via the DAAS. In addition, SUPSTARS files are updated by data that relate to casualty reporting, status, and casualty corrections pertaining to fleet activities in each NSC support area. When the supply system is unable to satisfy immediately a CASREPT materiel requirement, SUPSTARS is designed to:

- Expedite issue and shipment of materiel located outside the wholesale level to satisfy CASREPTs to include, using lateral support (assets at retail stock points);
- Expedite procurement where local purchase is required to acquire materiel to satisfy a CASREPT;
- Provide requisition status to requisitioners; and
- Provide management information to responsible commanders, through special reports or remote terminal inquiry, so that corrective action alternatives within their purviews can be exercised.

For items in the program, SUPSTARS assures constant, close communications among the item management activity, the supply and storage activities, the customers, and associated commanders.

c. The Aviation Supply Control Center (ASCC)

The ASCC system provides for monitoring of all urgent Naval aviation requirements including those assigned to other inventory managers. This highly automated system, managed by the Aviation Supply Office, provides status reports and statistics for monitoring and expediting materiel causing Navy and Marine Corps aircraft to be in a NORS or Not Fully Equipped (NFE) status. An NFE aircraft is one capable of safe flight, but lacking an item applicable to a mission essential subsystem which makes the aircraft incapable of performing one or more of the primary missions of the unit to which the aircraft is assigned. The ASCC is supported by a dedicated computer system. Input data is provided by DAAS which is programmed to provide ASCC with images of pertinent documents based on specific pre-arranged routing instructions. CLAMP requisitions and related supply support transactions are submitted to the ASCC through the CLAMP dedicated communications system.

The ASCC is dedicated to the reduction of NORS and NFE requisition processing times. In pursuit of this objective the ASCC:

- Has a reporting system and data file with requirements identified by a Weapons System Designation Code, relating each requirement to specific models and types of aircraft and a Unit Identification Code;

— Measures requisition processing times; highlights delays by the ICP, the stock point, and the procurement agency; and focuses management attention on failures to meet Uniform Materiel Movement and Issue Priority System (UMMIPS) processing times;

— Initiates follow-up actions; and

— Provides management reports to the materiel managers and fleet commanders.

D. AIR FORCE

1. General

To support the operating and training forces of the Air Force worldwide, the Air Force has a separate logistics command, the Air Force Logistics Command (AFLC). The Commanding General, AFLC, is tasked by the Chief of Staff to develop policies, procedures, concepts, and management techniques for organizational and intermediate level maintenance systems and to develop policies and procedures for materiel management, initial product support, and technical and engineering data to include related mechanized programs. AFLC Headquarters is also tasked as the Air Force stock fund manager and the central computer system design and program agency for the wholesale level.

Five major subordinate Air Logistics Centers (ALCs) assist AFLC Headquarters in accomplishing the assigned Air Force logistics support mission. They are:

Oklahoma City Air Logistics Center (OCALC)
Ogden Air Logistics Center (OOALC)
San Antonio Air Logistics Center (SAALC)
Warner Robins Air Logistics Center (WRALC)
Sacramento Air Logistics Center (SMALC)

The Air Force Logistics Command Retail Stock Control and Distribution Central Locator Management System is used to provide inventory accounting for items in support of base organizations and maintenance organizations located at the Air Logistics Centers. The system provides for the overall receipt, storage, issue, and accounting for unserviceable reparable materiel that is part of the wholesale inventory and provides for maintenance of warehouse locations applicable to wholesale stocks. The system provides materiel management and customer support through standardization of distribution decisions and depot processes.

Base level materiel accountability and control of equipment is accomplished through the Standard Base Supply System (SBSS). The SBSS applies uniform dedicated programs and hardware (UNIVAC 1050-II) to supply management at base level worldwide. The UNIVAC 1050-II is employed on a dedicated basis at 127 base locations, which in turn provide computer support to 145 satellite accounts at bases which lack transaction volume to warrant a dedicated system.

Among the objectives of these basic Air Force systems for Air Force-wide materiel management is the maintenance of operational readiness within economic constraints. Each of the basic Air Force-wide systems provides for recognition of short supply and potentially short supply situations. However, these basic materiel management and control systems are supplemented by three or more intensive management programs specifically designed for the identification and close control of items causing or potentially causing readiness support problems. These special programs are:

- The Air Force Recoverable Assembly Management System (AFRAMS);
 - The Serialized Control and Reporting System (SCARS);
- and
- The Critical Item Program (CIP).

2. The Air Force Recoverable Assembly Management System (AFRAMS). AFRAMS is the extension of the Air Force standard materiel management system for recoverable items having depot overhaul and condemnation levels authorized. It is an intensive item management program applied to depot level reparables because of their high unit cost, demand value, procurement value, and inventory investment. The program applies to over 100 thousand depot level reparables.* Intensive management methodology for AFRAMS items includes:

- Daily worldwide asset reporting;
- Automatic release and redistribution of base level excesses;
- Manual control and redistribution of assets within "authorized" levels;
- Close scrutiny of depot repair and condemnation status;

*SOURCE: Joint DoD retail Inventory Management and Stockage Policy Working Group Report.

- Application of "TIGHT ITEM" (potentially critical item) controls; and

- Use of high priorities for data communications; overhaul scheduling, and carcass movement.

3. The Serialized Control and Reporting System (SCARS)

SCARS is a subsystem of AFRAMS which applies extremely intensive management to a small range of reparable having a very high unit cost and/or a very high investment level. The system provides for serial number control of installed and in-use items as well as spares. As of mid-1977, eighteen items were designated SCARS items.

ALCs and bases managing or using SCARS items appoint SCARS monitors and alternates to coordinate control of items at their respective locations. In addition, the ALCs assign a primary and an alternate item manager for each SCARS item.

Items selected for SCARS management include all NSNs within the interchangeable and substitution (I&S) group of a primary item. Items are nominated by an ALC materiel manager. Approval authority for addition or deletion of a primary NSN from SCARS management rests with AFLC. Items selected for the SCARS program normally meet several of the following criteria; however, circumstances may deem selection of items based on one or more:

- Depot level reparable with a unit cost greater than \$100,000;
- A potential spare investment of \$7.5 million;
- Annual dollar value depot repair requirement greater than \$3 million;
- An annual dollar value of new procurement greater than \$3 million;
- The major portion of the acquisition phase should remain to be completed, permitting a significant dollar savings;
- Items for which serial numbers have been assigned or can be assigned to both installed items and spares; and
- Items of a highly technical nature or with other characteristics that warrant serialized control.

Special management actions, beyond these taken for "normal" AFRAMS items, which are applied for SCARS items are:

- SCARS items are controlled continuously by serial number;
- ALC Commanders appoint and publish names and telephone numbers of SCARS program and item managers to establish direct lines of communication within the SCARS program.
- Field requirements for SCARS items are processed manually to assure positive issue control. Inventory records are reviewed by item managers daily to ascertain deficits at base locations. Where deficits exist, managers have authority to redistribute assets between users or redirect serviceable assets available at repair or production sources.
- Base level stockage is computed by the ALC Item Manager (IM) in conjunction with the major using command.
- All verified NORS and ANORS requirements are reported to the ALC through submission of the daily NORS report if a verified NORS requirement for a SCARS item cannot be satisfied by local repair or IM redistribution action. War Reserve Materiel (WRM) assets are used to support the requirement if action will return an end item of equipment to an operational status.

4. The Critical Item Program (CIP)

One intensive item management program of the Air Force is referred to specifically as a "Critical Item Program" (CIP). Its precise stated purpose is to select and manage intensively a relatively small number of items having a major impact on readiness because of "support" or "cost" considerations. Hence, the CIP has two distinct segments: (1) "Support Critical Items" and (2) "Cost Critical Items." As of late 1976 there were 149 items in the Support Critical category and 197 items in the Cost Critical category.

Cost Critical Items are selected and managed on a basis similar to items selected for previously discussed high value, high intensity item management programs (e.g., they must be repairables with a unit cost of \$5,000 or more and represent an initial investment exceeding \$1 million). Support Critical Items are selected for intensive management based largely on their application and short supply status. The latter category of items

and their selection criteria are most directly applicable to this Study and, therefore, the following system description is oriented toward the "Support Critical Items."

Support Critical Items are selected, in part, through an automated data collection system designed to surface, for management review, those items that accumulate a high number of NORS hours at base level with insufficient wholesale stock to meet anticipated requirements. The various elements of this program are subsystems of the Air Force materiel management system; the SBSS at base level and the AFLC Retail Stock Control and Distribution Central Locator Management System at the ALCs.

Critical item identification is based upon data from the Aerospace Vehicle and Selected Items of Equipment Not Operationally Ready Supply reporting system. Data for this report is accumulated through base level input of Air Force (AF) 360 "NORS Detail Cards" to the ALCs identifying NORS requisitions to deadlined equipment. Input of the AF 360 cards provides, on an exception basis, the statistical data required to identify and isolate the most significant items contributing to NORS incidents and to highlight the problems, situations, and conditions which create NORS.

Items eligible for Support Critical designation must be replenishment spares (Reparables, Expendables, Economic Order Quantity (EOQ)) with a mission essential application (i.e., the item must be vital to the operation of certain aircraft; missiles; ground communications, electronics, or meteorological equipment; support equipment; ground photographic equipment; vehicles; line replacement units; engines; and trainers) and must be causing a designated number of NORS hours for such mission essential equipments and end items.

Selection of support critical items is based on input of daily NORS reports from field units. Items accumulating sufficient NORS hours to breach the threshold shown in the following listing become candidates for support critical status:

<u>Weapons/Equipment Supported</u>	<u>Accumulated Monthly NORS Hours</u>
Aircraft, Missiles, Ground Communications Electronics Meteorological (CEM), Support Equipment, Vehicles	1,000
Peculiar Items in Support of Low Popula- tion Aircraft (e.g., -EB, -66C, EC-121T)	500
Items in Support of Line Replacement Units (LRUs)	2,500 U-NORS
Engines	2,500 ENORS
Trainers	2,500
Cannibalization to delete or preclude NORS Conditions	1,000

When the designated number of NORS, Unit-NORS (U-NORS), or Engine NORS (ENORS) hours are accumulated, the item causing these situations is reviewed in detail. If serviceable (ready for issue) assets are not available the item may be designated "Support Critical."

Intensive management applied to critical items is as follows:

- Each ALC has a Critical Item Review Committee responsible for organization and administration of the ALC's implementation of the CIP. The Committee monitors the program to assure ALC compliance regarding item selection, documentation, reporting, timeliness, completeness, and adequacy of actions taken to correct critical item problems.

- Each ALC appoints a Critical Item Monitor who is the central coordinator and contact point between the review committee, major commands, and the item manager; develops the local policies and procedures in accordance with AFLC guidance and provides daily NORS reports to materiel managers; and forwards a listing of critical items approved by the ALC, to AFLC for publication to Air Force users.

— Monthly, AFLC publishes a listing of support critical items and their respective managing ALC, item managers, applicable weapons system, and forecasted "get well" dates. The list is provided to Air Force Bases, systems managers, and depot maintenance and supply activities with CIP item interests.

— Each base, using critical items, appoints a Critical Item Monitor responsible for CIP coordination on that base. A project officer is also assigned at each maintenance activity to validate critical item maintenance requirements and coordinate repair production. When a new item is designated critical, the bases perform an inventory of assets; raise the maintenance priority or repair of that item to priority 03; and commence daily asset reporting to the item manager via Automatic Digital Network (AUTODIN).

— Item managers are authorized to redistribute base serviceable assets in the CIP reporting system, except war reserve materiel and special support parts. Bases are directed to honor item manager telephoned redistribution orders within certain levels, i.e., redistribution of assets in excess of the computed requisitioning objective as directed; redistribution of assets down to the computed item safety level to satisfy priority 01 through 08 requirements; and shipping assets down to zero balance to satisfy priority 01 through 03 NORS needs.

— Base requirements for critical items get special processing considerations. Supply requests at bases are processed on a "fill or kill" basis. When serviceable base stock of the item is depleted, local repair is attempted. Requisitions for parts to repair critical items are assigned urgency of need "A" if the requirement is NORS and "B" otherwise, and all requisitions are marked "Critical Item" for improved identification and expeditious handling.

— When critical item requirements cannot be satisfied locally, lateral support may be attempted by major commands. Air Force policy states that the item manager is normally the single controller for distribution of critical items; however, bases are authorized to execute interbase lateral support without wholesale level approval. Lateral support is authorized in CONUS to satisfy NORS requirements and overseas to satisfy NORS and UMMIPS priority 01, 02, 03, 07, and 08 critical item needs.

— Depot repair of reparable critical items with back-orders is assigned maintenance precedent 01 and repair facility

workload schedules are to be renegotiated by CIP monitors via telephone with the goal of serviceable asset production as soon as possible.

In instances where repair or redistribution actions cannot satisfy UMMIPS priority 01 through 06 critical item requirements, emergency procurement of new assets can be used with ALC command level approval. Managers initiating approved emergency procurement requests do so orally, with written documentation provided within two working days. Buyers orally negotiate price, packaging, marking, and delivery with vendors; confirm the negotiated details immediately by electrically transmitted message; and follow-up these transactions with a written contract as practical.

E. MARINE CORPS

1. General

The Deputy Chief of Staff for Installations and Logistics is responsible to the Commandant for logistics plans, policies, logistical support planning, and life cycle support management of Marine Corps weapon systems and equipments. The Marine Corps Logistics Support Base, Atlantic (MCLSBA), under the Commandant's command, manages Marine Corps weapons system support and items of supply assigned the Corps for integrated materiel management. Fleet Marine Force Service Support Groups and Support Establishment Direct Support Stock Control Activities are the principal intermediate level of supply managers that provide direct non-aviation peculiar support to users.

The basic wholesale materiel management system of the Marine Corps is the Marine Corps Unified Materiel Management System (MUMMS). The MCLSBA at Albany, Georgia, is the prime management agency for Marine supply support and as such is the central agency for coordination and technical guidance for operation of the MUMMS. Supply management encompasses inventory control of expense type items (other than subsistence and commissary items) procured with the Marine Corps Stock Funds. Inventory control of expense items is restricted to approximately 30,000 nonreparable secondary items for which the Marine Corps is the de facto DoD item manager. Those inventory control functions conducted by the MCLSBA include requirements determination, procurement, receipt control, stock and issue control, inventory analysis, budgeting, financial stores accounting, performance measurement and excess determination. In support of its Weapons

System/Equipment Support Management (WS/ESM) responsibility the MCLSBA performs those functions relative to technical data, provisioning and computation of mobilization reserve and war reserve materiel requirements. Additionally, the MCLSBA performs functions relative to technical data, provisioning and computation of mobilization reserve materiel requirements.

Base and station level support is accomplished, largely, through the Direct Support Stock Control Subsystem (DSSC) of MUMMS. Direct materiel support of the Fleet Marine Forces for nonaviation peculiar items is accomplished through the Supported Activities Supply System (SASSY). In aggregate MUMMS, DSSC, and SASSY are the basic materiel support systems of the Marine Corps.

The Marine Corps depends heavily on the logistics systems of other DoD Components — especially the Army, Navy, and DLA — for component and part support for both consumable and reparable items. Therefore, there has been a trend away from secondary item management within the Marine Corps toward more intensive WS/ESM. In pursuit of more intensive WS/ESM the Marine Corps has developed and implemented a Logistics Information System (LIS).

2. Logistics Information System (LIS)

a. Objectives. The LIS, a management tool maintained by the MCLSBA, is designed to:

- Provide the Commandant of the Marine Corps with a centralized coordinated management information capability designed to monitor and analyze data from each in-house level of logistics management and external source.

- Influence the effectiveness of logistics support and information provided Marine Corps organizations.

- Maintain support visibility for a selective range of equipments and weapons systems.

b. System Description

The System monitors data for a selected range of equipments and weapon systems vital to operational support. For this range of equipments and weapon systems support, data accumulated and placed into management reports includes materiel status by stock number, the source of supply for the materiel, and the requiring unit.

A basic element of the LIS data base is the image copy of the Marine Corps unit requisition citing: NORS, ANORS or UMMIPS priority designations 01, 02, or 03, and status relating to the priority or NORS type requirement. These images are provided by DAAS via AUTODIN. Other inputs to the LIS include data identifying the owning unit, reason for deadline (e.g., supply or maintenance), repair echelon, and the unit holding deadlined equipment. Included in this data is the logistics readiness category of each Marine operational unit. This data is input bi-weekly.

Weapons system support managers are provided weekly management reports that show the status of all outstanding urgent requirements by operational Marine unit and weapon system, so that intensive management or expedite action can be applied to requirements for specific units. Similar information is provided for each weapon system, by unit, so that weapons system managers can ascertain the range of problems associated with a particular weapon system Marine Corps-wide. Finally, the reports permit identification of support items contributing most significantly to degraded operational readiness and provide Marine managers a ready reference to wholesale managers responsible for the items contributing most to deadlined equipment. Since the reports can be analyzed by requiring unit, by equipment or weapon system, or by source of supply, corrective action can be begun easily.

F. DEFENSE LOGISTICS AGENCY (DLA)

1. General

DLA is tasked by the Secretary of Defense to provide supply support, contract administration and logistics services to the Military Services and Federal Agencies within the U.S. Government. To accomplish this assignment, there are Supply Centers, Defense Contract Administration Services Regions, and Depots located throughout the CONUS. The Defense Fuel Supply Center (DFSC) and the Defense Personnel Support Center (DPSC) have regional fuel and subsistence offices respectively in the Pacific and European theaters. Within this overall structure, item management is performed by the six Defense Supply Centers:

- Defense Construction Supply Center (DCSC)
- Defense Electronics Supply Center (DESC)
- Defense Fuel Supply Center (DFSC)
- Defense General Supply Center (DGSC)
- Defense Industrial Supply Center (DISC)
- Defense Personnel Supply Center (DPSC)

Within DLA, the Standard Automated Materiel Management System (SAMMS) is the basic item management system for the performance of tasks such as cataloging, requirements determination, procurement, requisition processing, and distribution. Each Center applies a part of the basic System; for certain commodities, variations of the System are applied.

The basic materiel management system of DLA is supplemented by three systems, programs, or organizations designed to provide special, more intensive management to items based on item characteristics, application, or supply status:

- The Selective Materiel Management Program;
- The Weapon System Support Program (WSSP); and
- The Emergency Supply Operations Centers (ESOCs)

2. The Selective Materiel Management Program

a. Objective. The DLA Selective Materiel Management Program is designed to recognize the relative importance of items by virtue of their demand frequency, demand value, and weapon system application. Using these characteristics to group items DLA applies intensive management techniques to specific inventory segments with the objective of providing the best stock availability within certain funding levels.

b. System Description

The Selective Materiel Management Program segments items into five basic management categories:

(1) Very Important Program (VIP) items which are considered to be of greatest importance and are given concentrated management attention by the most skilled item managers. Included in the VIP category are weapon systems support items and others considered by the Defense Supply Center (DSC) Commander to be of sufficient importance in terms of criticality or value to warrant the most intensive management; items with a history of frequent out-of-stock positions due to continuing wide fluctuations in demand, procurement difficulty, or other unfavorable item management traits; and new items which because of cost or importance must be reviewed at frequent intervals.

(2) "High Value" items which have annual demand dollar value over \$4,500.

(3) "Medium Value" items which have annual demand dollar value exceeding \$400 but not more than \$4,500.

(4) "Low Value" items which have annual demand dollar value of \$400 or less.

(5) Numeric Stockage Objective (NSO) items which have a low probability of demand, but which would have a severe impact on operational readiness if required and not available in stock.

The most intensive item management is prescribed for VIP items. Intensity declines if weapon system application is not identified and as demand value decreases. Implementation of the Selective Materiel Management Program was observed at two DSCs. To manage intensively items with the greatest potential impact on system performance and readiness support, these Centers assigned the most experienced item managers to oversee the VIP and High Value items. The degree of intensity was influenced by the number of items assigned to an item manager; e.g., 100 or less VIP or High Value items assigned to the more experienced managers, but 1,000 or more low value or low frequency of demand items to a less experienced manager.

Observations at the same DSCs indicated that approximately 80% of the items designated for VIP or High Value management had a weapon system support designator; that is, the item had application to a specific weapon system for which special management attention was requested.

3. The Weapon System Support Program (WSSP)

a. Objective. The WSSP is a program designed to sustain supply support of a specific range of materiel applicable to a set of designated weapon systems. The main objective of the program is to have an on-hand quantity of each item assigned to the WSSP available to meet requirements.

b. System Description

Nominations for weapon systems are submitted through and approved by the following Military Service elements respectively:

Army, Deputy Chief of Staff for Logistics; Navy, Commander, Naval Supply Systems Command; Air Force, Deputy Chief of Staff, Systems and Logistics; Marine Corps, Deputy Chief of Staff for Installations and Logistics. The respective Components identify the estimated item range to the weapon system and DLA reviews the nominations for program acceptance. Nominations are limited to systems designed for and having a primary combat function providing direct and immediate support to a combat weapon system. A combat weapon system is one designed as an instrument of combat, either offensive or defensive, used to destroy, injure, defeat, or threaten the enemy. A supplemental weapon system is one that provides direct and immediate support to a combat weapon system or situation such as reconnaissance, observation, or rescue.

After a weapon system is approved for WSSP management, Service Program Managers identify the DLA-managed items supporting their respective weapon system to the appropriate DSC. Selection of individual items is based on these criteria:

- Items required to support actual or forecasted requirements necessary to maintain a satisfactory operational readiness status of the approved weapon system.
- Items considered of such importance to the operational readiness of the weapon system that stockage is required for insurance purposes.

All WSSP items are specifically identified by the DSCs and all are given special item management attention. Most WSSP items are within the VIP category at DSCs and therefore given the most intensive item management.

4. The Emergency Supply Operation Centers (ESOCs)

a. Objectives. Headquarters DLA and each DSC has an ESOC. These organizations are oriented toward field operational readiness support. They are established to act as the Commander's contact point and coordinator for customer assistance requests, emergency support operations, and support for special projects approved by DLA.

b. System Description

Within their respective parent organizations ESOCs are organized to support field operations by crossing intra-DSC organization lines, e.g., expediting requisition response by coordinating

DSC action in item management, technical support, or procurement. To a large extent, the ESOC serves as a special project manager or a requisition processing manager — especially for UMMIPS priority designator 01, and for 02 and 03 NORS requirements.

ESOC personnel work directly with the inventory managers, procurement technicians, and equipment technicians to determine the best means of satisfying a particular requirement. Actions normally taken to satisfy requests for assistance include:

- Expediting shipment from stock;
- Expediting procurement for direct shipment to the customer through contract diversions or emergency buys;
- Identifying acceptable substitute items;
- Attempting to satisfy a requirement through lateral support by contacting Service logistics activities and users; and
- Screening assets held by the Defense Property Disposal Service.

The most extraordinary action pursued is lateral support, which is an attempt to locate needed stocks by contacting identified users to determine if they have assets that can be released to fill high priority requisitions. When the user agrees to release assets, the ESOC rejects the high priority requisition and advises the requiring unit to contact the activity with the available stock. The DSC takes no further action in the transaction. Lateral support is used when:

- The requirement is priority 01, or 02 or 03 NORS;
- The required item is a stocked item;
- The past usage of the required item indicates a reasonable probability that the item can be located in the desired quantity; and
- A likely potential supply source can be identified.

To identify potential assets below the wholesale level, several informally acquired information sources are queried along with a review of DLA materiel management system files. Specific aids

include: the Army Master Data List, the Navy Retail System Availability Listing, the Air Force Stock Number User Directory (SNUD), and the SAMMS Transaction History Files.

G. ANALYSIS

1. Introduction

The Memorandum directing this Study stated, "Criteria for designating an item as being in a 'critical' supply status and methodology for managing items so designated vary from Component to Component within the Department of Defense (DoD) and from Inventory Control Point (ICP) to ICP within certain Components." The Memorandum professed a need for greater consistency in the critical item designation process and the management techniques applied to items in a critical supply status.

Headquarters level briefings and on-site field research confirmed the assertions that the term "critical item" means many different things to different managers and that "critical item management" (to the extent the term was used) meant everything from a specific management program in one Military Service, to a broad range of "short supply" items in another case, to a small number of mission-essential items in a third case. To understand and evaluate the terms "critical items" and "critical item management," it is necessary to observe a broad spectrum of item management and operational readiness programs wherein the terms "special," "selective," "intensive," or "critical" are applied to items being managed or providing support.

Each of the following paragraphs presents one or more factors pertinent to this Study of "specialized management actions applied to items which are in short supply."

2. Item Management Systems

a. Basic Systems. The Army Commodity Command Standard System, the Navy Uniform Automated Data Processing System for Inventory Control Points, the Air Force Stock Control and Distribution Central Locator Management System, the Marine Corps Uniform Materiel Management System, and the Defense Logistics Agency Standard Automated Materiel Management System are the basic, highly automated systems designed for the performance of wholesale level item management. Each of these systems has one or more subsystems designed to compute item requirements, match forecast

requirements against assets, warn of potential materiel deficiencies, and initiate actions to balance supply and demand.

b. Supplemental Systems

While each Component having materiel management responsibility has one or more basic systems for accomplishing wholesale item management, each also identified categories of items which receive special — generally referred to as "selective" or "intensive" — item management attention. Items are assigned to such special management categories for one or a combination of the following reasons: (a) the item's application; (b) the magnitude of demand (quantity or frequency) for the item; (c) dollar value associated with the item (unit price, demand value, procurement value, or maintenance program value); and (d) supply status.

Among the item management programs providing special, selective, intensive, and, on occasion, "critical" item management within the DoD are:

(1) Army

— The Selective Item Management System (SIMS) and SIMS-X provide for the identification and control of over 3,000 secondary items in a short supply or potential short supply status.

— The Aviation Intensive Management Items (AIMI) program provides for the identification and close control of about 125 items vital to the support of aviation programs; AIMI includes about 34 Aviation Component Intensive Management System (ACIMS) items and 91 aviation "critical short supply items."

— The Automatic Return Items (ARI) system provides for the identification and control of about 5,000 recoverable, reparable items which (a) are "critical" because a zero asset position has occurred or is forecast; (b) are "critical" to the operation of an essential weapon system; or (c) have an annual procurement value over \$5 million.

(2) Navy

— The Fleet Intensified Repairables Management (FIRM) program provides for the identification and control of over 1,700 reparable items: (a) having high, over \$50,000, annual

repair and/or procurement cost; (b) causing three or more Casualty Reports annually; (c) having below average carcass return rates or repair cycle times; (d) being in short supply; and/or (e) identified by a fleet commander as the cause of a "critical" or "potentially critical" situation.

— The Closed Loop Aeronautical Management Program (CLAMP) provides for the identification and control of 9,000 reparable items essential to the support of vital aviation weapon systems and support equipments.

(3) Air Force

— The Air Force Recoverable Assembly Management System (AFRAMS) is the Air Force standard system for providing intensive management to recoverable items having depot overhaul and condemnation levels authorized.

— The Serialized Control and Reporting System (SCARS) is an AFRAMS subsystem providing for the superintensive management, including serial number control of installed and idle assets, of reparables having a very high unit cost (over \$100,000) and/or investment level (e.g., spares investment over \$7.5 million). As of mid-1977 only eighteen items were identified for SCARS management.

— The Critical Item Program (CIP) provides for the identification and control of items having a major impact or potential major impact on readiness because of "cost" or "support" considerations. As of late-1976 there were about 200 items identified for "cost critical" management and about 150 items for "support critical" management. Support critical items are items: (a) having application to a predetermined range of mission-essential aircraft, missiles, or support equipment; and (b) causing a designated number of NORS, E-NORS, or U-NORS hours for the mission essential equipments and end items; and (c) having serviceable assets only below the support level.

(4) Defense Logistics Agency (DLA)

— The Very Important Program (VIP) is a segment of the DLA Selective Item Management Program which provides for the identification of items qualifying for the most intensive management attention. The Program includes over 40,000 items managed by the six Defense Supply Centers. Qualifying criteria

may vary by Center, but generally include weapon systems support items considered by the DSC Commander to be of sufficient importance in terms of "criticality" or value to warrant special, intensive attention.

-- The Weapon System Support Program (WSSP) provides for the identification and control of a specific range of items applicable to the support of a designated set of Military Service-managed weapon systems. As of mid-1977 there were approximately 180,000 items designated for the intensive management applied to WSSP items. The Military Service weapon system managers and DLA item managers refer to WSSP items as being "critical" to the support of a combat, mission-essential, weapon system.

3. Operational Readiness Support Programs

In addition to the basic item management systems and special item management programs used by the DoD Components responsible for the management of secondary items, each Component has one or more systems, programs and organizations designed to review and evaluate operational readiness; and, within these programs, there are means for identifying items which are impacting or could adversely impact operational readiness.

Among the operational readiness support programs which identify critical or potentially critical items requiring special management attention are:

a. Army

-- The Missile and Rocket Equipment Report identifies NORS and ANORS conditions and provides a report for monitorship of items causing such conditions.

-- The Materiel Assistance Designated (MAD) reporting system generates a series of reports which list: (a) principal end item equipment shortages and the items causing the problem; (b) equipment status and related NORS requisitions; and (c) the source of supply (item management agent) responsible for the items degrading readiness or mission accomplishment.

b. Navy

-- The Supply Selective Treatment and Review System (SUPSTARS) calls attention to and provides for monitoring of items generating NORS requisitions for selected nonaviation program

requirements and causing an unusual number of fleet Casualty Reports (CASREPTs). SUPSTARS also provides for the generation of expediting and associated with the NORS and NFE requisitions.

— The Aviation Supply Control Center (ASCC) program provides for identification of aviation program support items causing NORS and NFE requirements and monitorship of supply support actions associated with the NORS and NFE requisitions.

c. Air Force

— The Aerospace Vehicle and Selected Items of Equipment Not Operationally Ready Supply (NORS) reporting system provides the means for identification and isolation of support items contributing most significantly to deteriorated readiness.

— The Critical Item Program (CIP) goes beyond item management and, based on NORS reporting system data, provides a multitude of management reports associated with the control of critical items.

d. Marine Corps

— The Logistics Information System (LIS) provides for the accumulation of data for items causing Issue Priority Group (IPG) I, NORS or ANORS requirements and permits the identification and monitorship of: (a) Marine Corps units having less than ready conditions, (b) equipments having unusually poor readiness, (c) supporting items causing NORS and ANORS, and (d) the materiel managers responsible for items causing high priority NORS and ANORS conditions.

e. Defense Logistics Agency

— The Emergency Supply Operation Centers (ESOCs) serve special project managers or requisition processing coordinators for requirements having UMMIPS Issue Priority Designator (IPD) 01, or IPD 02 or 03 NORS requirements. While the actions taken by ESOC personnel supplement those of the item managers, the ESOC actions are generally oriented toward expediting a specific supply transaction aimed at alleviating a less than optimum readiness situation.

4. Features of the Special Management Systems/Programs

a. Objectives. A review of the several intensive item management programs shows that each of the programs seeks better supply management, through the maintenance of ready for issue inventory to meet requirements, and a high degree of readiness. Each of the operational support readiness programs seeks high readiness through the swift recognition and correction of deficient or potentially deficient materiel support which is or can cause operational problems; hence the programs seek improved materiel support. Because a continuing high degree of operational readiness is dependent on effective materiel support, the basic objectives of special management programs for item management and operational readiness are interdependent and similar.

b. Reference to "Critical"

The word "Critical" is used in a number of the special management programs and in reference to both items and situations. Examples are:

— An item being managed may be referred to as being in a "critical short supply" situation; i.e., assets are not available to meet requirements.

— An item being managed may be referred to as "cost critical"; i.e., the item may absorb an unusual dollar value of resources.

— An equipment end item and/or weapon system being supported may be referred to as "critical"; i.e., very important or vital to a specific operational mission.

— A supporting item may be referred to as "having critical application"; i.e., be vital to the operation of a very important or vital equipment, end item, or weapon system.

Within the spectrum of this review only one special management program included the word critical in its title. It is the Critical Item Program of the Air Force; and here too the program includes a segment for "Cost Critical Items" and another for "Support Critical Items."

c. Degrees of Intensive Management

Special, intensive item management programs apply to item categories ranging in size from less than 50 items to over 50,000 items. Examples at each extreme are:

- The WSSP of DLA which contains over 180,000 items;
- The VIP of DLA containing over 40,000 items;
- The recoverable, reparable item management program (ARI, IRAM, and AFRAMS), each of which contains over 5,000 items;
- The "Support Critical" segment of the Air Force CIP which contains less than 200 items; and
- The SCARS segment of the Air Force recoverable, reparable item system which contains less than 25 items.

The readiness support programs which are based on a deterred or potentially deterred readiness situation can be related to an infinite number of items. However, basing these programs on such factors as NORS, ANORS, U-NORS, E-NORS requirements, and UMMIPS IPG I requirements tends to limit the item range or document transaction range to which special management is applied.

Attaining the objectives and fulfilling the needs of special, intensive item management always requires the application of some additional resources, in terms of personnel or equipment (e.g., Automatic Data Processing Equipment (ADPE)). The more intensive the management, the greater the resource application.

None of the special item management systems and programs observed provide the means for ascertaining directly related program costs. However, certain programs demonstrated a relative degree of management emphasis which also indicates the relative cost. For example, the CIP and SCARS items of the Air Force and the VIP items of DLA receive very intensive management requiring special reports, conferences, procedures, and organizations. Casual observation of item management and associated issue control systems for the items and their associated transactions within these programs indicates that they receive management attention and resource application at least ten times greater than the run-of-the-mill items.

In general, as the item selection process becomes more finite and more restrictive and the number of items falling into the selective category becomes smaller, the significance of the program becomes more universally recognized, the management effort becomes more intense, and the "criticality" of the situation (item management-wise and readiness-wise) is more readily accepted.

d. Range of Action Taken

Every special management program results in some special actions. These range from the developments of goals and evaluation reports to the establishment of organizations dedicated to special program performance.

The supply actions taken to avoid or remedy "short supply" actions are significant to this Study effort. Of primary importance to the Study are the special or extra-special actions taken when an item is in "short supply," causing an adverse impact on operational readiness, and by one definition or another designated as "Support Critical."

Among the actions taken for the support of critical items are: (a) preparing and distributing listings of the items to announce the item's supply status; (b) expediting supply actions (e.g., issue, purchase, maintenance, and transportation); and (c) initiating lateral support. Most actions of this nature are considered and applied to alleviate any short supply situation. One action, lateral support through the search for assets below the wholesale level and the initiation of movement from one intermediate or retail level to another, is generally reserved for the most critical support situations. It is among the most time-consuming and intensive management actions.

Each Military Service ICP visited had a means for locating assets below the wholesale level. Generally, this was accomplished through review of data in an intra-service allowance or authorization program; on occasion it was by the initiation of queries. One DLA program uses Military Service data to identify potential sources of supply below the wholesale level. In all cases, however, the initiation of lateral support, subsequent to identification of retail assets, was accomplished only with the explicit approval of the owning commander.

H. SUMMARY OBSERVATIONS AND CONCLUSIONS

1. Each DoD Component having item management responsibility has a basic system designed for the management of secondary items of supply and, in addition, one or more special programs for the "selective" or "intensive" management of items having certain characteristics or attaining a certain supply status.

2. Each of the Selective Item Management and Intensive Item Management Programs augments the basic Component or ICP item management system with special information, actions, or controls and is designed to avoid or overcome an undesirable supply situation.

3. Over 200,000 items are identified and controlled within the several intensive item management programs of the DoD.

4. Each Military Service has an operational readiness support program to monitor and expedite wholesale management satisfaction of urgent requirements, including critical equipments and end items, and components and parts critical to their operation.

5. Generally, the special management programs for operational readiness support have features aimed at recognition of short supply situations or potential short supply situations which will adversely impact operational readiness.

6. Certain Selective Item Management Programs provide for asset visibility and control beyond the wholesale level on an intra-service basis; however, only one of the special item management programs provides the potential for locating below wholesale level assets on an interservice or DoD-wide basis and none provide for wholesale item manager control of assets below the wholesale level.

7. Currently, "critical" items are not exclusively defined or identified DoD-wide, but may be managed within any of the various selective item management programs delineated in this chapter.

CHAPTER III

CRITICAL ITEM DEFINITION

A. INTRODUCTION

1. Current Definitions and Interpretations

The current Department of Defense (DoD) definition of a critical item, as stated in Joint Chiefs of Staff (JCS) Publication 1, is:

"An essential item which is in short supply or expected to be in short supply for an extended period."

A review of Component dictionaries, glossaries, and other publications which include a critical item definition reveals duplication of the JCS Pub 1 definition quoted above. This appears to indicate uniform agreement on what a critical item is; however, during headquarters level briefings and field research visits to Inventory Control Points (ICPs) of each Component an entirely different viewpoint emerged. The briefers and ICP personnel gave the impression that although this definition is acceptable for publications, it is too vague and ambiguous to be applied to the day-to-day working environment. Hence, various interpretations of the JCS Pub 1 definition have been developed and are used in Component publications and by ICP personnel. Among the definitions accumulated from these sources are:

"Any item which requires immediate action to preclude or recover from a tenuous or critical stock position."

"Any item that has recorded a minimum of five NORS backorders in the LIS system."

"Items identified through AF NORS hours accumulations, cannibalization actions, and depot asset support status (Support Critical)."

"A Fleet Ballistic Missile System item in short supply."

Each of the definitions is an attempt to be more specific than the JCS Pub 1 definition in designating the type of items reaching critical status or in providing criteria on which to base criticality.

2. Use of the Definitions

None of the DoD Components applied the JCS Pub 1 definition exclusively in their day-to-day operating programs. Application of

the various definitions is illustrated by the item selection criteria of the special management programs discussed in the preceding Chapter. In addition, many of these special management programs contained items termed "cost critical" and items termed "support critical." The cost critical items generally fall into the "Very High" or "High" dollar value of predicted annual demand or annual issues as described in DoD Instruction 4140.33, "Grouping of Secondary Items for Supply Management Purposes," and they are afforded intensive management throughout their life cycle because of their dollar value or annual demand dollar value. The support critical items are generally afforded intensive management due to their supply status. The selection criteria of several special management programs contain provisions for both "cost" and "support" critical items.

The fact that no Component applies the JCS Pub 1 critical item definition, in its published form, to an ongoing management system indicates the inadequacy of the present definition. The fact that each Component identifies some items as being "critical" indicates the need for a definitive set of criteria to identify critical items.

3. Objective of this Chapter. The preceding Chapter discusses current programs used for the intensive management of items and points out methodologies embodied in each special management program. The system descriptions show that these programs relate to items adversely impacting the operational readiness of field units of the Military Services and that the programs are designed primarily to identify and overcome a short supply position by intensively managing items in short supply, including critical items. One objective of this Study is to provide criteria governing when an item becomes critical and when it is no longer to be termed critical. This Chapter addresses this objective by illustrating the various interpretations of the JCS Pub 1 "Critical Item" definition, showing why a characterization of a typical critical item cannot be developed, analyzing the current JCS Pub 1 definition, and developing criteria for identifying a manageable number of critical items.

B. CHARACTERIZATION OF CRITICAL ITEMS

1. General

As indicated by the immediately preceding paragraphs, the initial search for "standard criteria for identifying" critical items included a review of currently published and applied critical item terminology. In light of the various definitions and interpretations encountered, it became necessary to seek another approach to characterization of critical items. Therefore, one objective of the item data collection (described in paragraph F, Chapter I) was to accumulate

data which could possibly contribute to the definitive description of items which become critical. Data accumulated, such as unit price, consumable or reparable designation, and single or multiple application, provide the bases for this review and analysis.

The data displayed in the tables of this paragraph are generally related to the 523 item sample. Because of the manner in which the 523 item sample was accumulated virtually all (over 99%) of the items are managed by ICPs as stocked items. Where only a portion of the data is applicable, an explanation for the smaller number is provided.

2. Unit Price

Table III-1 displays summary data for the critical items by unit price categories.

Table III-1
UNIT PRICE OF CRITICAL ITEMS

Unit Price Category	Team Sample		ICP Sample		Total Sample	
	Items	%	Items	%	Items	%
0 to \$25	65	24.9	52	19.9	117	22.4
\$26 to \$100	23	8.8	18	6.9	41	7.9
\$101 to \$1,000	97	37.2	64	24.5	161	30.8
\$1,001 to \$5,000	46	17.6	76	29.1	122	23.4
Over \$5,000	30	11.5	51	19.6	81	15.5
Total	261 ^{1/}	100.0	261	100.0	522 ^{1/}	100.0

Source: Field Research

^{1/} One item excluded from the sample because the item was new and a standard unit price had not been established.

The Table illustrates that items determined to be critical by either the Study Team's criteria or the ICP's criteria had a wide range of unit prices — from less than \$25 to over \$5,000. Further, the distribution is relatively similar for each segment of the overall sample. The data indicates that unit price is not a factor which can be used to identify critical items.

3. Annual Demand

Table III-2 displays summary data for the critical items by annual demand categories.

Table III-2

ANNUAL DEMAND OF CRITICAL ITEMS

Annual Demand Quantities	Team Sample		ICP Sample		Total Sample	
	Items	%	Items	%	Items	%
0 - 1	12	4.8	4	2.0	16	3.5
2 - 5	18	7.2	4	2.0	22	4.9
6 - 15	30	12.0	25	12.4	55	12.1
16 - 20	3	1.2	10	4.9	13	2.9
21 - 50	35	13.9	40	19.8	75	16.6
Over 50	153	60.9	119 ^{1/}	58.9	272	60.0
Total	251	100.0	202	100.0	453 ^{2/}	100.0

Source: Field Research

^{1/} 52 items in DISC sample excluded because a basic item selection criterion was high demand value.

^{2/} Excludes 18 items for which annual demand quantities were not identifiable; 11 in the Team Sample and 7 in the ICP Sample.

Table III-2 illustrates that items determined to be critical fell into each of the identified annual demand categories. However, the vast majority of the items had annual demands exceeding 20. Item criticality cannot be associated with very low, sporadic annual demand, and annual demand is not a basis for characterizing critical items.

4. Consumable and Repairable Items

Table III-3 displays summary data for critical items by consumable and repairable item categories.

Table III-3

CONSUMABLE AND REPARABLE CRITICAL ITEMS

Category	Team Sample		ICP Sample		Total Sample	
	Items	%	Items	%	Items	%
Consumable	132	50.4	101	38.7	233	44.6
Repairable	130	49.6	160	61.3	290	55.4
Total	262	100.0	261	100.0	523	100.0

Source: Field Research

Data in Table III-3 shows that 55.4% of the items in the 523 item sample are reparable. Since over half of the items in the critical item sample are reparable and only about 12% of the DoD-managed items are nonconsumable, it may be assumed that reparable have a greater tendency to become critical. However, the fact that the number of critical items is distributed nearly equally between consumable and reparable items indicates that consumability or reparability is not a basis for identifying criticality.

5. Single and Multiple Application

Table III-4 displays summary data for critical items based on whether the item had single or multiple application.

Table III-4

APPLICATION OF CRITICAL ITEMS

Application	Team Sample		ICP Sample		Total Sample	
	Items	%	Items	%	Items	%
Single	171	74.0	154	60.2	325	66.7
Multiple	60	26.0	102	39.8	162	33.3
Total	231	100.0	256	100.0	487 ^{1/}	100.0

Source: Field Research

^{1/} Excludes 36 items (31 from the Team Sample and 5 from the ICP Sample) for which application data could not be identified.

Data in Table III-4 demonstrated that two-thirds of the critical items identified had a single application identified. However, the other one-third had multiple applications identified. Therefore, single vice multiple item application does not provide a means for characterization of critical items.

6. War Reserve Requirements

Table III-5 shows summary data for critical items based on whether the item had war reserve requirements or not.

Data in Table III-5 indicates that over 50% of the items becoming critical are not the same items identified as requiring the computation of war reserve requirements. Hence, the application of war reserve requirements computation is not a basis for characterizing critical items.

Table III-5

CRITICAL ITEMS WITH AND WITHOUT WAR RESERVE REQUIREMENTS

Category	Team Sample		ICP Sample		Total Sample	
	Items	%	Items	%	Items	%
With WRR	100	38.2	119	45.6	219	41.9
Without WRR	162	61.8	142	54.4	304	58.1
Total	262	100.0	261	100.0	523	100.0

Source: Field Research

7. Below Wholesale Level Allowances

Table III-6 displays summary data for critical items based on the item manager's knowledge of the existence or nonexistence of allowance quantities below the wholesale level.

Table III-6

CRITICAL ITEMS WITH AND WITHOUT ALLOWANCES

Category	Team Sample		ICP Sample		Total Sample	
	Items	%	Items	%	Items	%
With Allowances	102	51.0	130	63.1	232	57.1
Without Allowances	98	49.0	76	36.9	174	42.9
Total	200	100.0	206	100.0	406 ^{1/}	100.0

Source: Field Research

^{1/} Excludes 117 items (about 22% of sample) for which item managers could not determine, without extensive research, whether an item had allowance quantities or not. Ninety-seven of the 117 excluded items are managed by DISC which does not have knowledge of Military Service stockage allowances below the wholesale level.

Data in Table III-6 demonstrates that over 55% of the critical items being managed by Military Service ICPs are items which have designated allowance quantities. On the other hand, for over 40% of the critical items, allowance quantities below the wholesale level could not be identified. While this factor may be significant in any process aimed at locating below wholesale level assets, it is not a factor which permits characterization of a critical item.

8. Summary. The review of data associated with 523 items identified as critical items demonstrates that the critical item range includes items:

- Having low, medium, and high unit prices;
- Having low, medium, and high annual demand;
- Managed as consumables and reparable;
- With single and multiple application;
- Managed with and without war reserve requirements; and
- With and without allowance quantities.

A typical critical item cannot be characterized or defined through the application of criteria such as these, applied individually or in combinations.

C. THE CURRENT DEFINITION

1. General

The Introduction to this Chapter points out that the current JCS Pub 1 definition is ambiguous, variously interpreted, and variously applied. To ascertain the reason for ambiguity and, hopefully, overcome this deficiency, this paragraph is devoted to analyzing the elements of the present definition which is:

"An essential item which is in short supply or expected to be in short supply for an extended period."

An immediate reaction to the definition is that it can be broken into three parts, each of which can be stated as a question. The questions are:

- What is an essential item?
- What is meant by short supply?
- What is meant by expected to be in short supply for an extended period?

Each of these questions must have a definitive answer, if the current critical item definition is to have a universal meaning throughout the DoD.

2. An Essential Item

a. Findings

A general definition of an "essential item" is published in DoD Instruction 4140.33, "Grouping of Secondary Items for Supply Management Purposes." The definition is:

"A support item or repair part whose lack renders the supported system or end item inoperable."

This general definition has broad application to virtually all repair parts or components of equipments or end items. For example, it is equally applicable to a small motor for a base washing machine or to a magneto required to start and operate an aircraft engine. Application of this broad, general definition of "essential item" within a critical item definition would result in a wide divergence in the type of equipments and end items being supported by selective and intensive management systems for critical support items.

In an attempt to be more specific, than the DoDI 4140.33 definition, the JCS Pub 1 and Military Service publications do not define an "essential item," but do provide expanded definitions for items such as "combat essential end item," "mission essential item," and "mission oriented item." ICPs attempt to be even more specific in identifying these items via definition, as illustrated in paragraph A.1. above. This indicates that the simple term — essential item — is not specific enough for a critical item definition and some phrase like mission-essential item or combat-essential item may be more appropriate. Among such definitions currently published are:

Mission Essential Materiel:

"That materiel, which is authorized and available to combat, combat support, combat service support, and combat readiness training forces to accomplish their assigned mission." (JCS Pub 1)

"That materiel which is authorized and available to combat, combat support, combat service support, and combat readiness training forces to accomplish their assigned mission. For the purpose of sizing organic industrial facilities, that Service-designated materiel authorized to combat, combat support, combat service support, and combat readiness training forces and activities, including Reserve and National Guard activities, which is required to support approved emergency and/or

war plans, and where the materiel is used to: (1) destroy the enemy or his capacity to continue war; (2) provide battlefield protection of personnel; (3) communicate under war conditions; (4) detect, locate, or maintain surveillance over the enemy; (5) provide combat transportation and support of men and materiel; and (6) support training functions, but is suitable for employment under emergency plans to meet purposes enumerated above." (DoDD 4151.1)

"That materiel assigned to strategic, tactical, general purpose, or defense forces which are to be employed by such forces to destroy the enemy or his capacity to continue war; to provide battlefield protection of personnel; to communicate under war conditions; to detect or locate the enemy; to permit contiguous combat transportation and support of men and materiel." (AR 310-25)

"Items for which Mobilization Reserve Stock Objectives (War Readiness Materiel) have been established." (AFM 11-1, Vol. 1)

Mission-Oriented Items:

"Items for which requirements computations are based upon the assessment of enemy capabilities expressed as a known or estimated quantity of total targets to be destroyed." (JCS Pub 1)

Mission-Essential Support Item:

"A secondary item not otherwise authorized for stockage but required to insure continued operation of an essential major item, system, or facility which is to be determined to be vital to an essential defense mission the unserviceability or failure of which would jeopardize a basic defense assignment or objective." (AR 310-25)

Combat-Essential End Item:

"An equipment item which is required by tactical units to accomplish the mission of closing with and/or destroying the enemy force." (AR 310-25)

b. Evaluation

The definition published in DoDI 4140.33 defines an essential item in very general terms which could result in any item vital to the operation of any equipment being classified as essential and, hence, critical.

In efforts aimed at greater definitization, a series of definitions for mission-essential and combat-essential items or materiel have been developed. Each of these expands on the basic, general, essential item definition with modifiers relating essentiality to military mission and uses one or more words such as "combat," "combat support," "combat readiness," "destruction of the enemy," "war conditions," "battlefield operations," "battlefield protection," "defense objective," or "defense mission."

Unfortunately, there is considerable difference between these various definitions and none provides a means to precisely identify or quantify critical items. Further, data available to item managers at ICPs does not, generally, provide for application data indicating that secondary items are supporting combat or mission-essential end items and equipments.

One element of a few definitions (i.e., the item should have a war reserve requirement) offered a basis for identification of precise items. However, when this single criterion is evaluated against data in Table III-5, it is recognized that only about 40% of the critical items identified by the Study Sample had known war reserve requirements. Hence, this single, most definitive criterion could not be applied exclusively.

In summary, applying the "essential item" portion of the critical item definition to items at an ICP without some additional crutch is currently impractical.

3. Short Supply

a. Findings

The term short supply is used routinely in performing and describing day-to-day materiel management functions. It is generally a factor considered in each gross and net requirements computation process. JCS Pub 1 defines the term as follows:

"An item is in short supply when the total stock on hand and anticipated receipts during a given period is less than the total estimated demand during that period."

Component and ICP publications using the term generally provide definitions which are identical or equivalent to the JCS Pub 1 definition. The term requires the combination of three elements to determine short supply.

First, there is an element of stock availability expressed in terms of stock on-hand and anticipated receipts. Second, there is an element of estimated demands which includes both forecasted demands and accumulated backorders. Third, there is an element of time expressed as a given period.

b. Evaluation

The first two elements of the definition "stock availability" and "estimated demands" are quantifiable. This quantification can be precise as to on-hand stock and backorders. However, the quantification is speculative with regard to "anticipated receipts" and "forecasted demand." All of these factors are essential to a requirements forecasting system which must include certain, less than precise, estimates. On the other hand, greater precision is required where identification of criticality is concerned.

The third element, "given period," is not prescribed in the current definition. One ICP visited interprets the "given period" as 60 days; another ICP uses 90 days; and a third does not specify a particular time frame, but indicates that the given period extends until positive supply action is taken.

In summary, a critical item definition containing the term "short supply" as currently defined and applied would continue to be ambiguous and lead to broad interpretations.

4. Expected to Be in Short Supply for an Extended Period

a. Findings. Quantification of this element of the current critical item definition was not obtained from any Component or ICP. Component and ICP publications do not provide a time factor for an "extended period." In response to queries, item managers interpreted an extended period to be any time from about 60 days to over six months.

b. Evaluation

The phrase "expected to be in short supply for an extended period" is not sufficiently definitive to assist in the identification of critical items.

Use of the word "expected" in the phrase does add a dimension to current definitions. It indicates that there are two categories of items: first, a set of "essential items" in "short supply"; i.e., critical items; and, second, a set of essential items "expected to be in short supply"; i.e., potentially critical items.

5. Summary. Dissection and analysis of the current critical item definition confirms that the term is ambiguous and subject to various interpretations. The analysis indicates that each of the three primary elements of the definition; (1) item essentiality, (2) supply status, and (3) time, requires more finite description, if these elements are to be used in identifying and managing critical items.

D. IDENTIFYING CRITICALITY

1. Introduction

Review of the special management programs, the current critical item definitions, and the characteristics of critical items as identified within the special management systems and by the current definitions has led to, or confirmed, the following conclusions:

- The current critical item definition is ambiguous and variously interpreted.
- Item characteristics, of themselves, do not present a means for defining or identifying critical items.
- "Critical items" exist and there is a need to identify them uniformly if extraordinary item management action is to be applied to such items in a meaningful, consistent manner.

Throughout the review of special management programs and the various definitions of items requiring special management attention it became evident that certain factors are very important. First, it was recognized that the number of items and the volume of transactions associated with a special item management category are important. Second, it was recognized that an item's essentiality, urgency of need, and asset status are factors vital to a critical item definition. Finally, it was recognized that these are the same elements considered in the current definition and that the major problem is finding a means for making these factors more definitive than they currently are.

It is the objective of the remainder of this Chapter to discuss "essentiality," "urgency of need," and "asset status" and provide the

means for more finite identification of critical items and quantification of the number of items which are likely to meet the critical item criteria at a given point in time.

2. The Essentiality and Urgency of Need Factors

Recognition of an item's essentiality is dependent on knowing the item's application and, on occasion, its specific use at the time a critical item determination is necessary. For example, the fuel pump used in an administrative vehicle may not be essential; the fuel pump for a battle tank may be essential. Knowing the application of the fuel pump is vital to the essentiality decision. Further, the fuel pump for the battle tank may not be essential from an urgency of need standpoint, if the tank is enroute to a Veterans Day display; but may be essential if the tank is deployed or is in the process of deployment. In making this determination, it is necessary to know the use being made of the end item. Hence, item application and urgency of need are important factors in a critical item determination and both must be recognized by an item manager.

Under the current materiel management systems there are methods which may be utilized to identify the application of some items, but primarily on an intraservice basis. The Army uses a Weapon System Designator Code on requisitions for items supporting a weapon system. Many of these items may be essential support items; however, since most requisitions are filled automatically, the item manager rarely sees these requisitions until the item is in a short supply state. In order to use this as a tool to identify these essential support items, some method of accumulating and relaying this information to the item manager at requirements review time would have to be developed. The Navy has a similar method of identification of essential support items in requisitions via a project code; however, like the Army system this information is not accumulated or relayed to Navy item managers. For each Not Operationally Ready Supply (NORS) requisition generated, Air Force units submit a separate transmittal to the commodity Air Logistics Center (ALC). The NORS designation is an indicator of essentiality. These transmittals are accumulated in terms of NORS hours as part of the selection criteria for the Air Force Critical Item Program. The Marine Corps collects high priority and NORS requisitions in its Logistics Information System and has one or more reports available from this system which relate the items requisitioned to specific weapon systems. The Defense Logistics Agency (DLA) Weapon System Support Program (WSSP) identifies the most essential weapon systems items to DLA managers.

The existence of these various flags for emphasizing item essentiality and urgency of need indicated that these coupled with the item manager's experience and item application data could be used to identify essential, critical items. As a result, several of the techniques were reviewed in more detail.

a. Not Operationally Ready Supply (NORS) Requirements. Since several of the special management programs described in Chapter II use NORS or variations of NORS as a means for identifying essentiality and urgency of need, the use of these designators is considered as a means for the more finite identification of essential, urgently needed items.

(1) Findings

Military Standard Requisitioning and Issue Procedures (MILSTRIP) includes a provision whereby materiel support needs that impact adversely on primary weapon systems can be given special identification. MILSTRIP codes to designate a requirement NORS informs the materiel manager of "a condition status of an equipment or system in the physical possession of an operational unit that cannot be returned to ready status, nor can maintenance work be performed, until the required supply item is available at the work site for the continuance of the maintenance work." Because of Component support system peculiarities and a desire to broaden the use of NORS type designators, the Services have unilaterally developed and use other terms and codes to identify materiel support needs impacting readiness. Those used most often are:

— Not Fully Equipped (NFE) which is a Navy term depicting an aircraft in an operational unit that is capable of performing one or more of that unit's primary missions, but has limitations in operational capability due to lack of parts or components requested; and

— Engine Not Operationally Ready Supply (ENORS) which is an Air Force term depicting an uninstalled engine in a spares status that requires materiel support before repair can start or be resumed.

Standard MILSTRIP codings for specified NORS requirements are:

— Units located overseas and those Continental United States (CONUS) elements alerted for deployment within 30 days are directed to use "999" coding in the requisition "Required Delivery Date" data element field to identify a NORS requirement.

— Units located in CONUS and not alerted for deployment are directed to use "N" in the first position of the requisition "Required Delivery Date" data element field to identify a NORS requirement.

— CONUS units are directed to use an "E" to signal an anticipated NORS condition will occur unless the requested parts are not received.

In addition to this standard coding, the following special coding is authorized:

— The Army permits use of a "G" in the first position of the requisition serial number.

— The Navy uses a family of NORS-type coding depending upon the unit, its location, its readiness status, and supply item required. Nonaviation units submitting NORS-type requirements to satisfy a degraded readiness position and reported within the Casualty Reporting System use a "W" in the first position of the requisition serial number and a Casualty Reporting System Project Code in the project code data element field. Aviation units submitting NORS requirements sometimes use a "G" in the first position of the requisition serial number and an Aviation Project Code in the project code data element field. In addition, if the required supply item is a Closed Loop Aeronautical Management Program (CLAMP) item, a Navy-peculiar group of codes is used in the requisition in lieu of those set forth in MILSTRIP.

(2) Evaluation

The review of NORS, variations of NORS, and their associated coding structures demonstrates that only the standard codes such as "999" are universally recognized, while certain Service peculiar codes are either not recognized or ignored by ICPs of other Components. Failure to recognize or react results in certain NORS requisitions being given routine treatment rather than high priority, special treatment.

Rapid, precise identification is necessary if critical items are to receive the immediate, special management attention such items deserve. Hence, NORS and the multiple coding and processing techniques associated with the variety of NORS designators are not sufficiently definitive for the DoD-wide recognition of critical items.

b. Priority Designators. The review of NORS, variations of NORS, and related projects and codes having failed to provide a precise means for identifying critical items on a DoD-wide basis, a review of the high priority designators within the Uniform Materiel Movement and Issue Priority System (UMMIPS) was pursued.

(1) Findings

Table III-7 displays the Priority Designators (PDs) 01 through 15 as derived by combining the Force Activity Designators (FADs) and Urgency of Need Designators (UNDs).

Table III-7

DERIVATION OF PRIORITY DESIGNATORS

Force Activity Designator	Urgency of Need Designator		
	A	B	C
I	01	04	11
II	02	05	12
III	03	06	13
IV	07	09	14
V	08	10	15

Source: DoDD 4410.6 Encl (1)

Requirements are transmitted to the ICP via MILSTRIP transactions and are processed in accordance with Uniform Materiel Movement and Issue Priority System transaction priority and the Required Delivery Date (RDD). Transaction priority is derived from two factors — the Force/Activity Designator and the Urgency of Need Designator. The FAD is assigned to a requisitioning activity by the Secretary of Defense, the Joint Chiefs of Staff, or by each DoD Component and indicates the importance of that Force/Activity to the Defense mission and/or indicates the mission essentiality of the Force/Activity. Criteria governing the assignment of FADs are contained in Enclosure (1) to DoDD 4410.6, UMMIPS, which states, that "FAD I assignments are reserved for those units, projects or forces which are most important militarily in the opinion of the Joint Chiefs of Staff and as approved by the Secretary of Defense," and that FAD I will be assigned to:

"1. Programs which have been approved for top national priority by the President as set forth in the BRICK-BAT Category of the latest DoD Master Urgency List....

"2. Units, projects, or forces, including foreign country forces, which have been specifically designated by the Secretary of Defense on the recommendation of the Joint Chiefs of Staff."

FAD II will be assigned to:

"1. United States combat, combat ready, and direct combat support forces deployed outside CONUS in specific theaters or areas designated by the Secretary of Defense on the recommendation of the Joint Chiefs of Staff.

"2. Those CONUS forces being maintained in a state of combat readiness for immediate (within 24 hours) employment or deployment.

"....."

FAD III will be assigned to:

"1. All other U.S. combat ready and direct combat support forces outside CONUS not included under Designator II.

"2. Those CONUS forces being maintained in a state of combat readiness for deployment to combat prior to D+30.

"....."

FAD IV will be assigned to:

"1. United States forces being maintained in a state of combat readiness for deployment to combat during the period D+90.

"2. DoD Component programs and projects which are comparable importance with elements specified in 1. above.

"....."

FAD V will be assigned to "all other U.S. forces or activities including staff, administrative, and base/post supply type activities plus other programs and foreign forces not provided a higher designator."

These criteria, especially those for FADs I and II, are specific. They provide a clear distinction between those forces required to maintain a state of readiness for deployment in less than 24 hours and forces which are not required to maintain such a high state of readiness. Those forces/activities authorized to use FAD I or FAD II

are required to maintain the highest degree of operational readiness and are those which submit the requirements most likely to meet a criticality test.

The second designator, the UND, specifies the urgency of need or end use of the requisitioned item and determination is made by the requisitioning activity as to which UND will be used. The criteria governing the assignment of UND are also contained in enclosure 1 to DoDD 4410.6, UMMIPS, which states, in part, that UND A will be used in requisitioning materiel:

"Required for immediate end-use and without which the Force/Activity is unable to perform assigned operational missions or such condition will occur within 15 days in the CONUS and 20 days overseas."

UND B will be used in requisitioning materiel:

"Required for immediate end-use and without which the capability of the Force/Activity to perform assigned operational missions is impaired."

UND C will be used in requisitioning materiel not covered by other designators, including replenishment of stock.

The most clear distinction between UND A and B vice C is the immediacy of need indicated for UNDs A and B, but not for C. The most precise and important distinction between "A" and "B" is the "unable to perform" indication for "A" vice "impaired" performance indicated for "B." UND A informs supply distribution system managers that the unit needing support is incapable of performing its assigned mission without that support. Because of the compressed time within which the supply distribution system is expected to satisfy such requirements and the costs associated with required expedited action, the unit commander must certify that he is unable to accomplish his mission without the requested materiel. Use of UND B informs supply distribution system managers that the capability of a unit in performing its assigned mission is impaired without the requested support. These requirements are to be satisfied expeditiously, but not within the very compressed time frames established for UND A. Requirements assigned UND B are reviewed by unit personnel appointed by the requiring unit commander. Materiel required to replenish stock levels computed by field units are assigned UND C and processed as "normal business by the distribution system." Within this UND structure, UND A is the only one conveying the ultra-urgent requirement associated with item criticality and the specificity which contributes to a recognition of critical item situations.

(2) Evaluation

UMMIPS provides a structure aligning equivalent priorities with equivalent requirements throughout the DoD. A key to the system is equivalency and uniformity. Uniformity in the definition of mission importance and mission performance is fundamental to a system that assists management in directing equitable use of DoD stocks. A system like UMMIPS that depends on uniformity requires that safeguards be established to assure like interpretation and application of criteria by all users. Within UMMIPS FADs and UNDs are used to categorize the importance of the operation and the urgency of a requirement. FADs and UNDs are carefully delineated. Most definitive are FADs I and II and UND A.

In combination, FAD and UND permit determination of a Priority Designator (PD). The combination using FADs I and II and UND A identifies those requirements causing top priority mission-essential military operations from being performed. The combination leads to Priority Designators 01 and 02, the most important, most urgent, and hence, most critical requirements within the priority structure of the DoD.

To the extent UMMIPS direction is followed, it provides the means for identifying the most critical requirements on a DoD-wide basis in a format understood by all requisitioners and all inventory managers. Since the JCS and/or the Secretary of Defense must approve the assignment of FADs I and II to a force/activity and a commander must personally "certify an inability to perform a mission" as indicated by UND A, the requisitions bearing PD 01 and 02 most certainly represent the most stringently controlled part of UMMIPS and do represent the most critical needs. Therefore, UMMIPS Priority Designators 01 and 02 provide a definitive means for identifying item essentiality and requirements criticality on a DoD-wide basis.

3. Asset Status

In the previous section it has been determined that a critical requirement is one which has application to a mission-essential force/activity and is, or will be (within 24 hours), causing nonperformance of the mission. Such requirements can be readily identified through the existence of PD 01 and 02 requisitions. This requirement criterion must now be coupled with an item's asset status to determine the point in time an item becomes critical.

Throughout the discussion of current definitions, it is repeatedly emphasized that current use of general requirements terminology, such as "short supply," "demand forecast," or "anticipated receipts,"

collectively or individually, contributes to the imprecision of the definition. Any definition including factors based on the future, such as anticipated deliveries or shortfalls, will continue to require speculation and, hence, reflect the inaccuracies of such projections. In fact, a definition based on potential short supply could result in all mission-essential items being classified as critical regardless of the present supply status.

The review of current special item management programs shows that such programs apply to items ranging from less than one hundred to over 100 thousand. The review also points out that as the item range expands the degree of management attention decreases. To assure that mission-essential items generating the most critical requirements and highest priority requisitions receive the intensive attention they deserve the range of items must be precisely defined and, hopefully, limited in range through the application of an asset criterion.

To assure precision, limit the number of items identified as critical, and enhance the potential for applying extraordinary action to critical items, it has been determined that an item should be designated critical for supply management purposes at the point in time PD 01 or 02 requirements are on-hand and cannot be met — that is, a zero ready-for-issue situation exists. This combination of circumstances,

- * Ø Balance Supply Status and

- * PD 01 or 02 Requisitions On-hand,

can be recognized precisely throughout the DoD; provides finite recognition of a critical supply situation; and justifies maximum item management attention, including initiation of extraordinary management action.

4. Quantification of Critical Items

Among the objectives sought in developing a precise critical item definition was the identification of a manageable number of items. A finite number of items was not predetermined; however, it was assumed that the critical items requiring ultra-special management attention should be only a small percent of the items managed.

Current data systems do not provide information showing the number of items with PD 01 or 02 requirements and, simultaneously, in a zero stock position. To ascertain the results of a critical

item determination based on these criteria, it was necessary to perform a special analysis using management information provided by the Defense Logistics Services Center, the Defense Automatic Addressing System Office, and MILSTEP Reports. The analysis, as described in Appendix D, provided the information for Table III-8.

Table III-8

ESTIMATED NUMBER OF CRITICAL ITEMS
AS OF A POINT IN TIME
(30 June 1977)

Priority Designator	Items With Zero Balance		
	Stocked	Nonstocked	Total
01	30	135	165
02	5,947	26,427	32,374
Total	5,977	26,562 ^{1/}	32,539

Source: Analysis as described in Appendix D

- 1/ The estimate for nonstocked items is a worst case estimate. The actual number of nonstocked critical items will probably be significantly smaller.

The data in Table III-8 indicates that as of a given point in time, in this case 30 June 1977, there would have been about 32,500 critical items. This represents less than 0.9% of the secondary items managed within the DoD. Of this total only about six thousand (18%) of the critical items were managed as stocked items. This relatively small range of items presents an order of magnitude which can be identified precisely and managed intensively. Further, the very small number of critical items managed as stocked items (about 0.2% of the secondary items) and the ultra-small number of critical items identified with the PD 01 category represent orders of magnitude for which extraordinary management actions can be applied when a critical item situation is recognized.

E. SUMMARY OBSERVATIONS AND CONCLUSIONS

1. There are currently several special management programs designed to preclude items from reaching "critical supply status." In spite of these various systems, some items, because of non-availability, cause serious support problems — these items are in a "critical supply status" and thus, are "critical items."

2. The official and unofficial critical item definitions currently used by item managers variously interpret and apply the imprecise JCS Pub 1 critical item criteria of "essential item," "in short supply," and "expected to be in short supply for an extended period."

3. The current critical item definition includes two distinct categories of items: (1) items approaching a critical supply status and (2) items in a critical supply status. The former category contains a broad range of items which are difficult to identify; the latter category is composed of a relatively restricted number of items which can be described and identified at any given point in time. These two categories should be identified and handled separately.

4. Item characteristics, such as unit price, annual demand, or reparability, do not provide the means to identify critical items.

5. Certain factors related to an item, such as (a) the item's application, (b) the mission essentiality of the force/activity supported by the item, (c) the urgency of need for the item, and (4) the item's asset status, do influence a criticality determination.

6. The term "Critical Item" should be applied only to items for which (a) a Priority Designator 01 or 02 requirement is known, and (b) the serviceable asset status is zero at the wholesale management level. Application of these criteria to items across the DoD will result in a precise, consistent identification of a relatively small number of items to which the application of extraordinary management effort is most desirable.

7. While critical items, as identified above, definitely merit supra-management attention, other items identified as vital to the support of mission-essential equipments and end items have the potential of becoming critical items and, therefore, may require special management attention within one of the currently established intensive item management programs.

CHAPTER IV

MANAGEMENT ACTIONS FOR AVOIDING OR VOIDING CRITICAL ITEM STATUS

A. INTRODUCTION

As indicated in previous Chapters, each Department of Defense (DoD) Component responsible for the management of secondary items of supply has one or more basic item management systems designed to balance supply and demand. Further, each of these systems coupled with intensive item management and readiness support management programs has features designed to recognize potential and actual critical supply support situations. In spite of the existence and application of these programs, some items do experience stock availability problems; short supply and critical supply situations do develop.

Research for this Study showed that short supply situations are relatively common, but that the number and percent of items in a critical supply status, as defined in the analysis and conclusions of Chapter III, are relatively small.

The reasons items are in short supply or become critical are numerous, including less than perfect: stock versus nonstock decisions, engineering failure estimates, requirements forecasts, supply forecasts, leadtime calculations and application, and fund availability and application. It is contemplated that imperfection will exist within these functions throughout the foreseeable future and, therefore, some short supply and critical supply situations will continue to occur.

The objective of this Chapter is to provide an inventory of actions taken when potential or actual short supply situations are recognized, ascertain the frequency and general effectiveness of the actions, and identify any special actions which are most applicable to critical item situations.

B. RANGE OF ACTIONS APPLIED OR CONSIDERED

1. General. Each Component headquarters and Inventory Control Point (ICP) briefing included a discussion of programs and actions actually used or considered for use to avoid or overcome critical item status. Identification of the actions taken

within these programs was also a part of the item-by-item research conducted at each ICP visited. Both techniques resulted in an early observation that the critical item management actions identified by component managers, activity managers, and item managers include a broad range of actions which are or can be applied to any short supply situation and could be classified as routine, special, or extraordinary.

2. Inventory of Actions

The following actions are mentioned two or more times by activity managers or item managers as among the means for avoiding or overcoming critical supply status:

- Backorder and fill the requirements through normal replenishment.
- Expedite procurement by:
 - . Rescheduling for earlier delivery; or
 - . Diverting delivery to meet the more urgent requirements; or
 - . Initiating a new contract, especially "spot buys."
- Expedite maintenance (at contractor or organic facilities) by:
 - . Rescheduling for early delivery; or
 - . Diverting delivery to meet the more urgent requirements; or
 - . Initiating new input to maintenance.
- Initiate technical or engineering research to identify:
 - . Interchangeable or substitute items for issue; or
 - . Next higher assemblies for issue; or
 - . Cannibalization potential; or
 - . Fabrication potential.

- Issue (borrow) from war reserve stocks.
- Locate below wholesale level inventory and initiate redistribution of such assets, including lateral support action.
- Initiate cannibalization.
- Screen the disposal system to locate assets.
- Pull (or borrow) assets, usually repair parts or components from a predesignated program such as an end item overhaul or production program or a training program to meet the immediate operational requirement.

In providing this inventory of actions, managers emphasized that many actions are applied routinely and, on occasion, in combinations. Further, it was pointed out that one action could lead to another; e.g., a quantity could be borrowed from one program and diverted to meet an urgent requirement and an expedite action could be initiated to replace the borrowed or diverted asset.

The sequence in which actions are attempted and the stated desirability of actions varies from ICP to ICP and, on occasion, from item manager to item manager. Sequence and desirability depended on activity philosophy and procedures as well as on the experience of the item managers. Quantification of frequency of use, desirability of use, and success of application was not provided by Components, ICPs, or managers.

3. Frequency of Application

To determine the frequency with which specific actions are applied to critical item situations, field research at ICPs included the accumulation of such information from item records and through item manager interviews. Data related to 471 critical items shows that 542 supply actions were identified. These actions were distributed as follows:

<u>Action Identified</u>	<u>Number</u>	<u>%</u>
Expedited Procurement	147	27.1
Issue (borrowed) War Reserve Stocks	140	25.8
Expedited Maintenance	133	24.6
Normal Replenishment (Hi Pri B/O)	59	10.9
Redistribution of Below Wholesale Assets	43	7.9
Technical or Engineering Review (Special) ^{1/}	11	2.0
Cannibalization and Issue	9	1.7
Total Identified	<u>542^{2/}</u>	<u>100.0</u>

^{1/} Includes only those non-routine technical or engineering reviews taken to identify an extraordinary action which could be taken to avoid or overcome a critical supply situation.

^{2/} Greater than 471 because multiple actions were taken for some items.

Observations indicated and item managers confirmed that:

— Certain actions go hand-in-hand; for example, technical reviews frequently lead to a cannibalization or other action.

— A large majority of actions, especially the expediting and normal replenishment actions accounting for over 60% of the actions listed, are applicable to any actual or potential short supply situation.

— Certain actions, such as redistribution of assets from below the wholesale level and issue of war reserve stocks, have excellent potential, but are among the most difficult to accomplish and, generally, are attempted only for the most crucial situations.

— Certain actions, such as cannibalization, are very time consuming, because a series of actions are required (i.e., identification of the cannibalization potential, direction of the action, location of the end items or component containing the required item, removal of the item, inspection and packaging of the item, and delivery to the requiring customer).

4. Effectiveness of Actions

Situations were identified where each of the categories of actions in the above listing can provide relief from a short supply or critical supply situation. For example, expedited procurement or expedited maintenance can be applied when quantities have reached

the end of a production or maintenance line and are simply awaiting inspection and delivery. Normal replenishment can suffice when a delivery from past procurement actions is momentary. Since these actions are the easiest to accomplish, can produce immediate results, and are part of a normal day-to-day item management job, they are considered routinely. For potential short supply situations and actual short supply situations short of critical item status, the degree to which these routine actions are used (about 60% of the time) is a fair indication of their effectiveness.

Similarly, the actions at the lower end of the usage list (technical/engineering review leading to the issue of substitutes or next high assemblies, or to cannibalization) are a likely indication of their success for overcoming short supply situations. The smaller application occurs in part because such tasks are time consuming and frequently difficult.

Two actions, the issue of war reserve stocks and the redistribution of below wholesale level assets, were applied about 26% and 8% of the time, respectively. Data available to item managers indicated that the latter of these actions had potential effectiveness greater than current application indicates. This was demonstrated in cases where item managers (with minimal research) could locate either allowance quantities of a short supply item, but did not take action to apply such inventory to meet current requirements. Item manager reluctance to initiate this action was generally based on one or both of the following reasons:

- Doubt as to whether the current requirement (e.g., an Issue Priority Group I requisition) justified the action; and/or

- The reluctance, and frequent refusal, of commanders holding below wholesale level assets to release such assets to meet someone else's requirements.

When such actions were taken by item managers, most were intra-service actions accomplished through lateral support procedures.

C. APPLICATION OF ACTIONS TO CRITICAL ITEMS

1. Avoiding Critical Item Status

a. General

As stated in previous paragraphs, the multitude of actions taken to avoid critical item status are also the actions

taken to avoid short supply in general. Further, to the extent factors such as administrative and production leadtimes, carcass return rates, repair cycles, and requirement forecasts can be improved and made more accurate, critical item situations should decrease. However, improvement in any of these tasks or functions should also decrease short supply situations in general and are merely steps toward the overall improvement of supply management. Such improvements are sought constantly by materiel managers, whether critical item situations exist or not.

One policy and its related actions are oriented toward meeting high priority requirements. It is the policy to establish control levels for certain items to assure asset availability for high priority requisitions. Another action related to meeting high priority requirements, when routine actions fail, is the release and issue of war reserve stocks. Both of these actions could have application to critical item avoidance and are discussed here as possible "preventive" actions.

b. Use of Control Levels

Control levels are a form of stock rationing. ICPs using the concept establish a point or level of inventory below which requisitions will not automatically be filled, but back-ordered. Use of control levels is authorized by DoD 4140.17-M, "Military Standard Requisitioning and Issue Procedures" which states:

"On occasion, available assets will be insufficient to satisfy all current demands and backorders for specific items. The materiel manager will reserve assets of such critical items through the use of item control levels and criteria which will restrict issue to specific categories of requirements only, i.e., those within designated ranges of Priority Designators, JCS approved projects of firm commitments for delivery of materiel to MAP recipients. Control levels will be established for materiel managers to reserve stocks for issue only for PD 01 through 03. These requirements will be satisfied by issue to zero stock balance of serviceable stocks. Control levels may be established at the discretion of the materiel manager to reserve a level of stocks which may not be issued for PD 09 through 15 requirements."

Observations during this Study indicate that establishment of control levels to avoid critical item status is

either (a) not being done or (b) not being done well. This contention is supported by the fact that 325 (69%) of the 471 critical items reviewed for this Study had IPG I - Not Operationally Ready Supply (NORS) or Casualty Report (CASREPT) requirements, but were in a zero balance, backorder stock position. A review of reasons for this situation reveals the following rationale for control level failures:

- Establishment of control levels to avoid critical item status is dependent on the fairly precise identification of mission/military essential items. This tool does not exist.

- Applying the concept to a very broad range of "potentially" critical items would result in "saving" assets for high priority requirements which may not materialize. In the meantime, special supply actions such as "spot buys" may be required to fill less urgent requirements and performance of these tasks could dilute the special management attention normally reserved for high priority needs.

- Applying the concept as quoted above would require a multi-level control dependent upon item demand knowledge by priority. For example, assume the priorities of the requirements for a specific item are distributed as follows:

Priority Designators 01, 02, and 03	10%
Priority Designators 01 through 08	35%
Priority Designators 01 through 15	100%

In this case, when Ready-For-Issue (RFI) stock on-hand reached 35% of the Requisitioning Objective (RO), only priority 01 through 08 requirements would be filled; when RFI stock on-hand reached 10% of the RO, only priority 01 through 03 requirements would be filled. Currently, ICPs do not accumulate requirements data in this manner; and, considering the imprecision of gross demand forecasting systems, suggesting a technique as sophisticated as this would be questionable.

In aggregate, the stumbling blocks to the establishment of a viable control level are many; and, the application of the control level concept for avoiding critical item situations is not likely to be effective within the foreseeable future.

c. Borrowing from War Reserve

The review of 471 critical items showed that 209 items (44%) had a computed war reserve requirement and most of these items had had war reserve stock available when the item reached a short supply position. One of the special actions taken to fill very high priority requirements for items in a short supply position is the issue of war reserve stock. Generally, issues of this type are limited to IPG I-NORS and CASREPT requisitions and, upon issue, other supply actions are taken to replace the war reserve quantities as expeditiously as possible. This process, referred to as "borrowing war reserve stocks," is relatively common and is usually accomplished within prescribed policies and controls; that is, application of the practice may require review and approval of a supervisor or command level manager.

As long as this special support action is limited to Priority Designator (PD) 01 and 02 requirements, borrowing of war reserve stocks should continue to be an extraordinary management action applied to fill critical requirements and avoid critical item supply status.

2. Filling Critical Item Requirements

a. General

Since item managers tend to apply actions for which past experience has shown a potential payoff, use of the currently successful actions will continue as items begin to experience problems. Consequently, by the time items are designated critical, benefits to be derived from the application of these actions will have been exhausted. Headquarters level and ICP briefings stressed the existence of policies and procedures indicating this to be the case. Observation of item manager actions provided further confirmation.

At the same time, managers emphasized and item research confirmed that at the point in time when an item becomes support critical, routine action may no longer suffice and special or extraordinary action is justified. Further, any action or actions to satisfy critical requirements should be responsive to the Uniform Materiel Movement and Issue Priority System (UMMIPS) time standards for satisfaction of IPG I requirements because PD 01 and 02 requirements indicate that the item deficiency is impacting adversely on the operational readiness of the requisitioner.

Realistically, the PD 01 and 02 requirements and the IPG I time standards for delivery can be met only through the location and shipment of ready-for-issue inventory. Consequently, special actions adopted for use when an item is designated critical should be actions aimed at the location and redistribution of RFI stock with minimum delay. Two actions of this type, in addition to the already applied release of war reserve assets, were observed:

- Location and retrieval of activity level excesses which had been forwarded to disposal; and

- Location and redistribution of below wholesale level inventory.

b. Probing Disposal

When a user/consumer activity determines that an excess exists for a particular item and the value of the excess is greater than the minimum reporting level, an excess report is submitted to the wholesale item manager prior to initiating disposal action. However, if the value of the excess quantity is less than the line item reporting criteria (currently \$10; proposed \$20) the line items may be forwarded to disposal without informing the wholesale manager. Hence, it is possible that a low value activity excess may be forwarded to disposal at the same point in time that the wholesale manager has recognized a critical supply status situation for the item. While this possibility may be small, the importance of locating assets anywhere for critical items may justify a special query of the disposal system.

Of the ICPs visited during field research, only one indicated that a query of the Defense Property Disposal Service (DPDS) was made in an attempt to locate assets to fill high priority requirements when other more routine actions failed. A success rate of 3% was reported. Since the requirements filled as a result of such queries were IPG I requirements, the 3% return on effort was considered worthwhile.

A few other ICPs and item managers indicated that the DPDS has been queried, on occasion, but that results were minimal or nil; however, the actual results were not quantified by the ICPs or item managers.

Since (1) the range of stocked items in a critical item status at any given time should be small (estimated at less than 10,000), (2) the requirements for such items justify extraordinary actions, and (3) the experience of one ICP resulted in a 3% success rate, a DPDS query to locate critical item assets should be one of the extraordinary management actions applied for critical items.

c. Locating and Redistributing Below Wholesale Level Assets

Among the features of several of the special item management and readiness support management systems described in Chapter II of this Report is an option to locate assets below the wholesale level and, possibly, redistribute these assets. Generally, this option is low on the scale of special actions, following others such as expediting. Further, redistribution of below wholesale level assets is most prominently listed as an intraservice option and applied on a permissive, lateral support basis.

Data for 426 critical items managed by six military service ICPs showed that item managers could identify 232 items (54%) with below wholesale level "allowances" (i.e., the item was designated for stockage at a specific type of unit, on a particular type of ship, or at a finite set of bases). The existence of "allowances" for over half of the critical items indicates that a significant potential exists for filling critical requirements with assets from below the wholesale level, if the required quantity can be located and released.

The listing in paragraph B.3. of this Chapter shows that of 542 actions applied for critical items only about 8% involved redistribution of below wholesale assets. The following paragraph, B.4., states the reasons item managers are reluctant to initiate action to redistribute below wholesale level assets, even for critical requirements.

When items become critical in accordance with the finite criteria set forth in Chapter III of this Report, all the routine and semiroutine supply management actions for avoiding short supply and critical item status should have been taken. At this point in time, extraordinary actions to meet critical requirements represented by PD 01 and 02 requisitions are justified. One extraordinary action, location and redistribution of below wholesale level assets, is permitted by existing policy and appears to have the most potential for expanded application, but is applied on a very limited basis.

Because of the potential value this extraordinary action has to critical item management, the location and redistribution of below wholesale level assets to meet critical requirements is the subject of a separate, expanded analysis in the following Chapter.

D. SUMMARY OBSERVATIONS AND CONCLUSIONS

1. Generally the actions taken by a wholesale item manager to alleviate critical supply status are the same actions taken to avoid critical supply status or even short supply status. However, when an item is considered critical, the actions may be applied with more intensity.

2. Wholesale management actions taken most frequently for items in short supply, including critical items, are:

- Expedited procurement and maintenance;
- Borrowing and issuing war reserve stock; and
- Normal replenishment coupled with the establishment of high priority backorders.

Other actions taken with less frequency are:

- Redistribution of below wholesale level assets;
- Technical review leading to selective issue alternatives; and
- Cannibalization and issue.

3. The judicious application of each of the actions currently applied has merit in maintaining effective materiel support; and avoiding short and critical supply support situations can depend on any or all of the actions.

4. Within the foreseeable future the establishment of "control levels" is not likely to be an effective technique for avoiding critical item status.

5. When a critical item status, as prescribed in Chapter III, is recognized, two extraordinary actions which should be considered immediately as possible means of filling critical requirements are:

— Querying the DPDS for assets and

— Attempting to locate and redistribute below wholesale level assets.

Of these extraordinary actions, redistribution of below wholesale level assets offers the greatest potential for meeting a critical item requirement quickly.

CHAPTER V

SHARING DoD CRITICAL ITEM ASSETS

A. INTRODUCTION

The discussion, observations, and conclusions outlined previously relate to materiel management techniques used to identify and alleviate short supply and critical supply situations and to the development of standard criteria for defining critical items.

Generally, management actions taken by wholesale item managers to overcome critical supply problems are similar to the actions taken to avoid the situation; however, once the problem exists the actions are often applied more aggressively. Some of these aggressive management actions are used almost universally by wholesale managers while others are used infrequently. One action used infrequently, but when used offers excellent potential for overcoming a critical supply situation, is redistribution of resupply assets.

Resupply stocks referred to in this Report are those secondary item assets positioned below the wholesale level in support of consumer units, activities, or geographic areas; they are not assets positioned for immediate end use.

This Chapter reviews the potential productivity of Sharing critical item assets located at Service elements holding resupply stocks below the wholesale level. It includes a discussion of the management authority needed to execute Sharing equitably and effectively. Also included are discussions of Department of Defense (DoD) policy and program procedures which extend wholesale asset visibility and control below the wholesale level and could facilitate critical item management. Requisites for implementation of an effective critical item Sharing concept are included throughout the topic presentation.

Redistribution (Sharing) of resupply stock is dependent on:

- The identification of Service elements holding resupply stocks;
- The existence of critical item assets within these stocks;

— The ability to locate assets when a critical supply situation arises; and,

— The ability to effect redistribution of resupply assets to meet critical requirements.

B. LOCATION OF RESUPPLY STOCKS

1. General. Paramount to a Sharing concept is identification of critical item assets below the wholesale level. Each Service has a level of supply between the wholesale level and the final user or consumer. Service organizations manage these resupply stocks below the wholesale level in support of consumer units, activities, or a geographic area.

2. Elements Holding Resupply Stock

a. Army

The Army defines an intermediate echelon of the retail system as one organized to function as the interface between the wholesale level and user level. Organizational elements managing this level of resupply include, but are not necessarily limited to, Installation Supply Activities (ISA) and General Support Units.

These elements acquire materiel from the wholesale manager and position it for subsequent issue to Direct Support Units (DSUs). Some intermediate level DSUs provide other DSUs with stock record support services; however, as all DSUs are equipped with more sophisticated automated supply management capabilities, Army emphasis on interunit record keeping support will be phased out facilitating direct requisitioning by most DSUs to wholesale managers and, in turn, permit direct delivery of materiel from the wholesale to the direct support level. The General Support Unit at the Corps echelon will stock peacetime safety levels and selected item operating levels in wartime. Some DSUs provide direct supply support for combat, combat support, and combat service support field units. Other provide support to elements outside the Army Divisional Support Structure, i.e., support equipment and personnel densities within specific theaters or geographic areas. In spite of the fact that the General Support Units (GSUs) and the DSUs are deployable elements providing operational combat-oriented supply support within the Army, these units are generally resupply organizations. At fixed

installations where there are elements not supported by DSUs, the ISA provides the direct support and becomes the lowest organization involved in resupply. These activities are examples of the Army elements holding resupply stocks. Units nominated by the Army as representative of these elements were requested to submit resupply stock data in conjunction with this Study. They are listed in Appendix C.

b. Navy

The Navy positions materiel under a decentralized concept. Some assets aboard special purpose ships support the operating fleet while other inventories at shore activities resupply the afloat inventories and provide direct supply support to fleet elements for materiel not stocked aboard resupply or support ships. These levels of supply are in turn supported from assets located at shore based logistics support activities that support both afloat elements and ashore installations.

Materiel used by the Navy and not assigned to another integrated manager is managed by the "hardware" systems commands, project officers or Navy Inventory Control Points. Stocks most visible to and controlled by inventory managers at these activities are subjected to Transaction Item Reporting (TIR) and roughly equate to what is most often considered wholesale stock. The Navy refers to these stocks as "TIR Materiel" and the support activities stocking, using, and reporting this materiel as TIR operating sites. This materiel, less rotatable pool assets, is considered wholesale system stock whether it is positioned by the inventory manager, or requisitioned by the TIR operating site based upon asset allocations or local requirements computation. The Navy inventory manager exercises extensive control over TIR materiel prepositioned to TIR sites and these assets are generally available to meet the manager's worldwide integrated materiel requirements. Conversely, TIR materiel requisitioned by TIR sites is often protected for local requirements. The Navy is currently taking an additional step to assure protected levels of materiel at TIR operating sites. For instance, to protect materiel for aviation support, the Navy is currently implementing the Operational Support Inventory (OSI) Program.

The OSI is a quantity of materiel required to satisfy planned aircraft support program needs at specific TIR sites. Stock levels for OSI at TIR sites are recorded at the Inventory Control Point (ICP) as requirements or reservations to afford

protection against issues to other ICP customers. These stocks are generally reserved to support needs at the respective Naval TIR activity; however, they may be used to satisfy priority 01 and priority 02 Not Operationally Ready Supply national requirements.

Navy managed materiel not designated to be TIR is referred to as "non-TIR material." Some Naval activities ashore maintain stocks of Navy materiel designated both TIR and non-TIR but ships are non-TIR elements. Normally non-TIR materiel is not subjected to item accounting by the ICP, but visibility is maintained from cyclic stock status reports submitted by activities equipped with an automated materiel management capability. Examples of elements providing cyclic reports are air stations, logistics ships, and aircraft carriers.

Resupply inventory is procured and managed by Retail Stock Points, Consumer Stock Points, and mobile logistics support force ships within the Navy Retail Stock Fund. An additional fleet surface resupply level is the Coordinated Shipboard Allowance List materiel which is tailored for support of the equipment and weapon systems in each fleet surface combatant. An additional resupply echelon for Navy aviation elements is the Aviation Consolidated Allowance List materiel which is tailored for support of aviation elements. Examples of Navy units possessing resupply stocks that submitted asset data for use in this Study are included in Appendix C.

c. Air Force

The Air Force has several elements procuring materiel from the Air Force Logistics Command, other DoD integrated managers, and the General Services Administration in direct support of bases, missions of assigned units, unique equipment, or specialized requirements. Principal Air Force activities or elements managing materiel in the resupply role are: (1) Air Force bases, (2) Air Logistics Centers, (3) Military Airlift Command, (4) and Air Defense Command.

The Standard Base Supply System is employed by Air Force bases to support on-base and assigned off-base units. Air Logistics Centers manage wholesale stock for DoD and resupply

stocks in support of base operations and the collocated technical repair activities. The Military Airlift Command (MAC) prepositions materiel assets at stations along MAC air routes in support of MAC aircraft. Peculiar to specific MAC aircraft that transit the base, these items would not normally be stocked by the transited base's supply activity. Assets in this program are prepositioned from the "home" station and managed by the transited base as a subsidiary function of that base's supply account.

The Air Defense Command operates a central communications and electronics supply point in support of Aircraft Control and Warning Squadrons and Sites. These resupply stocks include Air Force and non-Air Force managed assets peculiar to ground communications and electronics systems under the Command's cognizance. In addition, the Air Force has a number of special support activities involved at the intermediate inventory echelon. Some of these activities support special equipment needs often involving classified missions and others operate in support of defense contractors where Government Furnished Materiel has been authorized. These activities and accounts are established only with Air Force Logistics Command approval, and their number varies over time.

Air Force units holding resupply stocks that submitted data for use in this Study are included in Appendix C.

d. Marine Corps

Within the Marine Corps the posts, bases, and stations, and the supporting elements are supported by a distinctive system not designed with mobility as a prerequisite. The Fleet Marine Force (FMF), the mobile combat aviation and ground force, is supplied by distinctive mobile systems and activities.

Resupply at major bases and stations is provided in large part by Direct Support Stock Control Activities (DSSCA). The DSSCA stocks materiel required for day-to-day support of the collocated base elements and tenant FMF units. These assets are stock funded, generally low cost, high demand housekeeping and administrative items. Also at this level, resupply stocks are managed by the Station Supply Department at Marine Corps Air Stations in support of station assigned aircraft.

Within the FMF, direct logistics support to combat, combat support, and combat service support elements for nonaviation peculiar supply is provided by the Force Service Support Group (FSSG). Materiel positioned at the FSSG is procured from the integrated manager and generally used as resupply in support of the FMF. These stocks do not duplicate items stocked by the DSSCA when a DSSCA is adjacent to FMF elements. Technical aviation supply support to FMF elements is provided by the Supply Department within each Marine Air Group (MAG). Aviation peculiar supply support to the MAG is provided in a manner similar to fleet aviation support outlined as part of the Navy Supply System.

The DSSCAs and Marine Corps Air Station Supply Department provide non-FMF resupply, and the FSSGs and MAG Supply Departments control resupply in the mobile FMF. Units holding Marine Corps resupply assets that submitted data for this Study are included in Appendix C.

3. Summary. The myriad systems, support structures, support philosophies, and inventory funding schemes within DoD preclude a concise characterization of the type of DoD element holding resupply stock; however, separation of consumer held stocks from the inventory level between wholesale and the customer can be accomplished with some precision. Stocks in this level are assets in support of specific consumer units, or activities, or geographic areas. They are resupply stocks, not assets positioned for immediate end use.

C. CRITICAL ITEM ASSET AVAILABILITY

1. General. To determine the extent of resupply asset availability the Services were requested to provide item stock status and control data from activities identified by the Services as holders of resupply stocks. The data call is described in Chapter I. The objectives of this data acquisition and review were to determine whether:

- Significant ranges of serviceable "intensively managed" (in most cases critical short supply) items were available within resupply assets below the wholesale level;

- Activities possessing resupply stock of critical items were of the same Component as that assigned wholesale management of the item;

— Resupply stocks of critical items exceeded the stockage levels computed at the controlling activity; and,

— Resupply assets of critical items were available at worldwide locations.

2. Asset Availability

Table V-1 illustrates data for 165 (of 471 critical items in the Study Sample) items with assets held by Service elements controlling resupply assets.

The data in Table V-1 indicates a potential to satisfy over 1/3 of the critical item requirements by Sharing resupply assets that are "ready for issue"; however, what is more important is that many critical items are available with assets in excess of locally computed stock levels. A number of critical items available at these units have assets which are potentially unit excess.

Availability of critical item resupply assets is greatest within the Service assigned DoD management responsibility for the item; however, there are assets in other Components, i.e., there are items assigned Service management located at elements holding resupply assets outside the Service assigned DoD management for a particular item. In addition, and as might be expected, Defense Logistics Agency (DLA) managed critical items are widely held by multiservice elements possessing resupply stocks.

Table V-2 displays the number of critical items available at Service elements controlling resupply stocks. It shows the relationship of the items available with the stock levels computed by those Service elements reporting critical item assets available. The Item Count is based on the number of different National Stock Numbers (NSNs) for which resupply assets were located. If an NSN were located at two or more places within a Service, the count is one.

Table V-3 provides in greater detail the basic data summarized in Table V-2. In addition, it shows the asset quantities of the items available at each reporting activity.

Table V-1

CRITICAL ITEMS WITH RESUPPLY STOCKS

Asset Location	Managing Component										Total	
	Army		Navy		Air Force		Marine Corps		DLA			
	Items	%	Items	%	Items	%	Items	%	Items	%	Items	%
One Service	59	33.5	20	21.5	23	20.9	24	51.1	15	33.3	141	29.9
Two Services	8	4.5	5	5.6	0	0	1	2.1	4	8.8	18	3.8
Three Services	0	0	0	0	1	0.9	1	2.1	2	4.4	4	0.9
Four Services	0	0	0	0	0	0	1	2.1	1	2.2	2	0.4
Total Items Located ^{1/}	67	38.0	25	27.1	24	21.8	27	57.4	22	48.7	165	35.0

Source: Service Data Submissions and Analysis

^{1/} Managing Component percentages are computed based on the total number of "critical items" in the Study Sample managed by that Component.

Table V-2

RESUPPLY STOCKS OF CRITICAL ITEMS EXCEEDING
COMPUTED STOCK LEVELS
 (By Service)

Reporting Service	Ready For Issue Stock		Items With Stock Greater Than:					
			Reserved Levels		Reorder Point		Requisitioning Objective	
	Items	% ^{1/}	Items	% ^{1/}	Items	% ^{1/}	Items	% ^{1/}
Army	75	15.9	75	15.9	44	9.3	30	6.4
Navy	45	9.6	45	9.6	34	7.2	19	4.0
Air Force	47	10.0	41 ^{2/}	8.7	42	8.9	25	5.3
Marine Corps	30	6.4	15 ^{2/}	3.2	20	4.2	20	4.2

Source: Service Data Submissions and Analysis

^{1/} Percentages are computed based on Sample total - 471 items.

^{2/} Maintenance of separate supply accounts for reserved stock by some field activities results in computed reservation levels that exceed reorder points and requisitioning objectives.

Table V-3

RESUPPLY STOCK OF CRITICAL ITEMS EXCEEDING COMPUTED STOCK LEVELS
(By Reporting Activity)

Reporting Activity	Ready For Issue Stock		Items With Stock Greater Than:					
			Reserved Levels		Reorder Point		Requisitioning Objective	
	Items	Qty ^{1/}	Items	Qty ^{1/}	Items	Qty ^{1/}	Items	Qty ^{1/}
1	30	595	15 ^{2/}	475	20	522	20	502
2	23	425	23 ^{2/}	425	6	299	3	179
3	22	82	22	82	17	61	10	51
4	21	1,588	21	1,588	8	1,221	8	521
5	15	61	15	61	7	11	6	8
6	14	202	14	202	5	172	5	144
7	12	825	9	791	7	699	3	432
8	12	922	12	882	11	503	8	53
9	11	65	9 ^{2/}	49	10	49	5	9
10	10	432	10 ^{2/}	432	7	207	3	21
11	9	74	9	74	5	53	1	1
12	9	16	6 ^{2/}	9	7	10	4	5
13	9	267	8 ^{2/}	255	7	234	3	13
14	8	91	8	91	0	0	0	0
15	8	14	8	14	8	10	1	2
16	8	39	6	16	5	23	2	17
17	8	217	7	212	7	131	3	21
18	7	742	7	742	2	70	2	51
19	7	1,606	7	1,606	4	1,391	4	655
20	6	225	6	225	5	78	1	51
21	6	516	2 ^{2/}	493	5	405	2	169
22	6	1,305	5 ^{2/}	1,293	5	1,272	3	1,267
23	5	48	5	48	5	38	3	28
24	5	18	5	18	4	10	2	7
25	5	9,589	5	9,589	5	8,950	4	8,153
26	4	10	4	10	2	5	2	4
27	4	104	4	104	4	28	0	0
28	4	43	4	43	3	34	1	16
29	4	1,345	4	1,345	4	1,311	1	808
30	4	184	4	184	4	124	3	112
31	4	24	4	24	4	10	0	0
32	3	32	3	32	3	16	0	0
33	3	13	3	13	3	9	0	0
34	3	16	3	7	3	12	2	10
35	2	16	2	16	1	13	1	11
36	2	594	2	594	0	0	0	0
37	2	2	2	2	2	2	0	0
38	2	17	2	17	1	1	0	0
39	1	1	1	1	1	1	0	0
40	0	0	0	0	0	0	0	0
41	0	0	0	0	0	0	0	0
42	0	0	0	0	0	0	0	0

Source: Service Data Submission and Analysis

- ^{1/} Quantity figures are the aggregate of the assets within the number of items reported by a particular reporting activity.
- ^{2/} Maintenance of separate supply accounts for reserved stock by some field activities results in computed reservation levels that exceed reorder points and requisitioning objectives.

Table V-4 summarizes by Federal Supply Group the critical items in the Study Sample with assets located at Service elements holding resupply stocks. This data illustrates that critical items and the resupply assets to satisfy critical item requirements are distributed across a wide variety of Federal Supply Groups. Included are repair parts, components and equipments ranging from the most common category such as hardware to the most direct military mission oriented such as weapons and guided missiles

Table V-4

ITEMS AVAILABLE AT ACTIVITIES HOLDING
RESUPPLY STOCKS

FSG	Description	Items
10	Weapons	4
13	Explosives	1
14	Guided Missiles	8
15	Aircraft; and Airframe Structural Components	6
16	Aircraft Components and Accessories	24
17	Aircraft Launching, Landing, and Ground Handling Equipment	1
25	Vehicular Equipment Components	3
26	Tires and Tubes	2
28	Engines, Turbines and Components	7
29	Engine Accessories	6
30	Mechanical Power Transmission Equipment	1
31	Bearings	7
40	Rope, Cable, Chain and Fittings	2
41	Fire Fighting, Rescue, and Safety Equipment	1
43	Pumps and Compressors	2
47	Pipe, Tubing, Hose and Fittings	3
48	Valves	4
49	Maintenance and Repair Shop Equipment	21
53	Hardware and Abrasives	20
58	Communication, Detection, and Coherent Radiation Equipment	20
59	Electrical and Electronic Equipment Components	4
61	Electric Wire and Power and Distribution Equipment	2
63	Alarm and Signal Systems	3
66	Instruments and Laboratory Equipment	12
95	Metal Bars, Sheets and Shapes	1

Source: Service Data Submission

These presentations illustrate that the potential for Sharing is significant. They reveal that critical item assets are available at many Service elements holding resupply stocks and indicate that critical item assets at these activities as a group can satisfy an extensive number of critical item requirements. More important, these tables illustrate that some critical item assets available at Service elements possessing resupply stocks are potentially excess.

Table V-5 portrays the geographic location of the critical item assets available at Service elements holding resupply stocks. This presentation indicates that critical item assets are likely to be available somewhere in resupply stocks and may be available in the same geographic area as the critical item requirement.

Table V-5

GEOGRAPHIC LOCATION OF RESUPPLY STOCK OF CRITICAL ITEMS

Geographic Area	Items With Resupply Stock	Percent ^{1/}
Europe	31	6.6
Pacific	37	7.9
CONUS	134	28.5
Europe and Pacific	64	13.6
Europe and CONUS	142	30.1
Pacific and CONUS	158	33.5
Europe, Pacific, and CONUS	165	35.0

Source: Service Data Submission and Analysis

^{1/} Percentages are computed using the total number of items in the Study Sample (471).

3. Summary. Analysis of data for 471 critical items demonstrates that:

- For 165 items (35% of the critical items) serviceable assets could be located in resupply stocks.
- In 176 instances of item locations, the resupply stocks on-hand exceeded Reserve Levels computed by the holding activity.

- In 140 instances of item locations, the resupply stocks on-hand exceeded the Reorder Point Quantity.
- In 94 instances of item locations, the resupply stocks on-hand exceeded the Requisitioning Objective and may have been in an "activity excess" position.
- Resupply stocks of critical items were available for an extended item range.
- Resupply stocks of critical items were available in large quantities within all Services.
- The geographic distribution of resupply stock assets of critical items was wide.

In aggregate, these findings and analyses indicate that Sharing critical item assets located at Service elements holding resupply stock is a potentially significant management option in DoD critical item management.

D. CRITICAL ITEM ASSET KNOWLEDGE

1. General

Identification of resupply inventories positioned world-wide outside the control of wholesale materiel manager is a basic element of a critical item Sharing technique. Information presented earlier demonstrates that Service elements controlling resupply stock can be identified and that resupply stocks applicable to critical requirements do exist for a significant percentage of the cases. Item asset knowledge from activities holding resupply stocks can be acquired as this Study indicates; however, practical procedures must be adopted for continuing critical item management. Where current DoD policy, procedures, or instructions that satisfy acquisition of asset knowledge below the wholesale level exist, the issuance is presented and its state of implementation discussed. A mutation of procedures used in support of other existing DoD programs to support critical item management would be practical. The emphasis here is to identify common procedures to reduce to a minimum the critical item management implementation impact upon the Components. Basic procedures, and the additions and modifications to the current Military Standard Procedures needed to accommodate Sharing are delineated in Chapter VI, Addendum VI-B.

The DoD has recognized a need for the wholesale manager to acquire intermediate level asset knowledge. DoD Instruction 4140.37, "Asset Knowledge and Control of Secondary Items," establishes the authority for wholesale managers to gain asset knowledge about selected items located beyond the current wholesale distribution activities. Military standard procedures to implement this policy are being developed and coordinated with the Services; however, to date development is not complete.

2. Current Status

Each Component routinely collects and maintains asset information for a selected range of materiel positioned beyond the wholesale echelon. However, there is little uniformity among the Services in the selection of items for extended visibility. In addition, selection of items to be visible at the wholesale level and the systems and procedures employed by the Services for communicating asset information relating to those items are many and varied. One common thread does prevail. These systems are limited to intraservice use. A wholesale manager can gain asset knowledge over selected items located beyond the wholesale level of the managing Component on an exception basis, but little, if any, beyond wholesale level asset knowledge is available to that same manager for like items located in other Components.

Currently wholesale managers rely on many formal and informal techniques to identify potential asset holders beyond the wholesale echelon. Some are supported by mechanized systems with output readily available to the manager but others rely on informal procedures which depend for effectiveness entirely on the individual ingenuity and perseverance of the manager.

During field research over 100 materiel management personnel were observed in their daily operation. Groups of these managers were often tasked with interrogating activities holding resupply stocks to obtain asset status for items needed to satisfy high priority field requirements when the wholesale stock level was unsatisfactory. Some managers had access to systems like the Air Force "Stock Number User Directory." Others were relying on cyclic asset reports such as the Navy "Retail System Availability List" or products from the Army "Asset Balance File." Still others were using numerous types of operational allowance lists, excess lists, or demand history files as their source of intelligence in an effort to locate potential asset holders beyond the wholesale echelon. Regardless of the system sophistication,

or value of these techniques for gaining intermediate level asset knowledge, their usefulness in integrated materiel management is marginal. Intraservice information related to those items managed by each Component is of limited value to the integrated wholesale materiel manager managing critical items.

Interservice asset visibility below the wholesale level is practically non-existent. Attempts to gain asset visibility below the wholesale level have been made, but nearly all have been developed on an intraservice basis. A Sharing technique that relies on the Service assigned wholesale management to use only resupply stocks of its field elements on a continuing basis to satisfy critical item requirements of other Component customers will not be acceptable. Wholesale managers equipped with current management tools are to a great degree restricted to this type of Sharing approach.

Unilateral Component action to improve interservice asset knowledge below the wholesale distribution system includes an informal exchange among activities at the wholesale level of Service files and reports mentioned previously. Generally, these sources are used by the wholesale manager for "leads" to where assets might be located. "Leads" are usually followed by telephone or message interrogation of activities holding resupply stocks. These procedures hamper both normal and critical item management as they are time consuming and unjustifiably encumber wholesale managers as well as those responding to the inquiries. These facts indicate a valid need to develop a mechanism capable of determining potential holders of specific items, and speeding and simplifying inquiries and responses for obtaining interservice critical item asset knowledge.

DoD Components are proceeding toward implementation of an approved Military Standard Transaction Reporting and Accounting Procedure (MILSTRAP) plan for extending interservice asset visibility of selected stock levels of secondary items. To date, implementation discussions have centered on interservice visibility of consumable materiel, but these procedures, scheduled for implementation on 1 September 1978, can be applied without major revision to critical items. They can accommodate interchange of asset status data between the elements holding resupply stocks and wholesale managers. They provide for transaction, daily, or monthly asset reporting, a range sufficient for managing critical items if the reporting frequency requirement designation is reserved for the wholesale manager. If

wholesale managers determine that the range of reporting codes now in existence does not satisfy their needs for critical item management, the range can be increased as needed by coordinating requirements with the Military Standard Systems Administrator and the Components.

Efforts to standardize and streamline procedures for extending interservice asset knowledge beyond the wholesale echelon are being made. If implemented as planned, and if used in managing critical items, MILSTRAP procedures will require wholesale managers to submit asset requests for critical items to Service Central Points. Central Points will identify respective Service elements holding resupply stocks and in turn solicit required asset information. Reporting of assets as currently outlined can take up to 60 days, however, there is a provision for "as soon as possible" responses. Shortcomings of these procedures for managing critical items are timeliness of reporting and thoroughness of asset knowledge.

3. Required Improvements

In addition to including all critical secondary items in the MILSTRAP procedures for extending asset visibility, the reporting procedure must be more complete, timely and accurate. Currently, MILSTRAP reporting procedures are restricted to elements assigned "Routing Identifier Code" in accordance with Military Standard Requisitioning and Issue Procedures (MILSTRIP). To accommodate critical item Sharing, each Service element with resupply stocks must be included as a potential source of critical item support. To reach this level of reporting thoroughness, the Services must assign a "Routing Identifier Code" to all elements holding resupply stock or the appropriate MILSTRAP reporting document formats must be modified to accept assigned DoD Activity Address Directory (DODAAD) Codes.

The 60 day provision for report initiation currently set forth in MILSTRAP will not support critical item Sharing. The system response must be commensurate with the Uniform Materiel Movement and Issue Priority System (UMMIPS) time frames established for processing priority 01 and 02 requirements.

Current MILSTRAP procedures encourage incomplete reporting. When a reporting activity is unable to report by the effective date established by the wholesale manager, a report is not to be submitted, sacrificing completeness of critical item asset knowledge

that would be available to the wholesale manager. Obviously, it is not realistic that the wholesale manager be provided critical item data after a date that the information could have influenced his management decision as to how to satisfy a critical item requirement. Equally as obvious is the need that the wholesale manager has for complete critical item asset knowledge if he is expected to reach a timely decision on how to use Sharing to satisfy a critical item need. To this end, the wholesale manager must establish realistic reporting dates and the Services must expedite reporting critical item asset data to meet the established due dates.

Previous DoD chartered studies identified problems associated with interservice communication between wholesale materiel managers and other Service supply elements. These studies have presented alternative mechanisms designed to improve the timeliness and efficiency of interservice communication. Basic to these communication schemes is the authority of the wholesale manager to communicate directly with Service activities controlling resupply stocks for the purpose of gaining asset knowledge. Recommendations included a fully mechanized DoD standard Registry of User Program. Adoption of a DoD-wide concept such as a "Registry of User Program" suggested by the Logistics Systems Policy Committee Task Group 6-73 would definitely facilitate a critical item Sharing concept. Rapid identification of all potential holders of critical items and direct communication by the wholesale manager with those elements holding assets is a way to attain DoD-wide asset data in a time frame commensurate with published requisition processing standards.

4. Summary

Critical item asset knowledge beyond the wholesale level on an interservice basis is essential to a Sharing scheme as part of DoD critical item management. There are numerous formal and informal information tools available within the various Components to gain improved asset visibility on an intraservice basis. Some of these tools have been exchanged among materiel management elements of the Components in an attempt to aid the wholesale manager in extending asset knowledge beyond Service boundaries, but use of these tools has been minimal and has provided minimal results. Proposals have been made to develop a DoD-wide system to identify Service elements beyond the wholesale level holding specific items. The potential benefits of such a tool for locating and controlling critical items are significant.

Improvement of current materiel reporting procedures to make them thorough and timely for reporting critical item assets located at activities holding resupply stocks would minimize the need for additional procedures to implement critical item Sharing.

E. CRITICAL ITEM ASSET CONTROL

1. General

Identification of activities holding resupply stocks and acquisition of critical item asset status by the wholesale manager must be accompanied by the ability to act on that intelligence to satisfy critical item requirements.

Satisfaction of wholesale critical item requirements from assets held by Service elements controlling resupply stocks requires that the wholesale manager have extended authority and a procedure to effect asset control.

2. Current Management Authority

Wholesale managers now have very limited asset knowledge and no control below the wholesale level. Generally, redistribution (Sharing) of supplies by the wholesale level managers, regardless of local stock status at units holding resupply stocks, can be accomplished only after approval of the "owning" field commander. Intraservice use of assets below the wholesale echelon can be directed by a common senior commander; however, such redistribution is a seldom used procedure.

DoD Component doctrine is that commanders are responsible for their logistic support. In fulfilling this responsibility commanders are reluctant to release assets within their control. Item managers indicate that efforts to obtain resupply stocks are generally frustrated by this doctrine and the commanders' prerogative to refuse such redistribution.

3. Management Authority for Asset Control

a. General

A field or activity commander is reluctant to consider materiel under his ownership or control, except excesses, available to satisfy critical item requirements of elements not within his command or support responsibility; however, retention of assets

for local use when higher priority national requirements exist is counterproductive in the effort to maintain the highest DoD levels of readiness.

If commanders are to give their authority to a wholesale manager to redistribute specific assets necessary to meet critical item requirements, commanders must believe their support of a critical item management program is working for the common benefit and will, at least occasionally, work in their behalf. Asset control in this sense does not refer to an authority given the wholesale manager to reposition or redistribute assets among the various echelons of the supply distribution system. The authority is to acquire specific quantities of very select items, i.e., Critical Items, to satisfy an immediate, high priority requirement that could not otherwise be fulfilled in a timely manner by the wholesale manager.

b. Limits of Authority

To become and remain an effective management technique, Sharing of resupply stocks of critical items must be positively defined and finitely limited. A standard must be established that informs DoD materiel managers and field commanders alike which resupply stocks are susceptible to Sharing to satisfy only specific critical item requirements. The role of the wholesale manager and the field commander must be fully understood.

By definition "critical item" relates to materiel needs that, left unsatisfied, preclude a Force or Activity from performing an assigned operational mission. DoD Instruction 4410.6 "Uniform Materiel Movement and Issue Priority System" defines those elements qualified to receive critical item support under the proposed critical item definition and criteria as:

- A top national priority program approved by the President.
- Elements or projects specifically approved by the Secretary of Defense.
- Specific military forces deployed from Continental United States (CONUS) to specific geographic areas designated by the Secretary of Defense.
- CONUS combat ready forces to be employed or deployed within 24 hours.

- DoD Component programs and projects vital to Defense or national objectives of comparable importance with those above.

- Specified foreign combat ready and direct support forces with comparable importance to U.S. Forces as specified above.

- Federal agency programs vital to Defense or national objectives designated by the Secretary of Defense.

When the wholesale system is unable to satisfy urgent materiel requirements in support of top national priorities, in support of forces vital to Defense, or in support of efforts to achieve specific national objectives then other assets in the DoD Distribution System should be considered to meet such needs. This Sharing of resupply assets below the wholesale level must be limited to these needs and considered only to satisfy such requirements.

Figure V-1 depicts the relationship of the critical item inventory located at activities holding resupply stock to each activity's computed requirements level. Given the authority to Share the critical item assets located at these elements, the wholesale managers could:

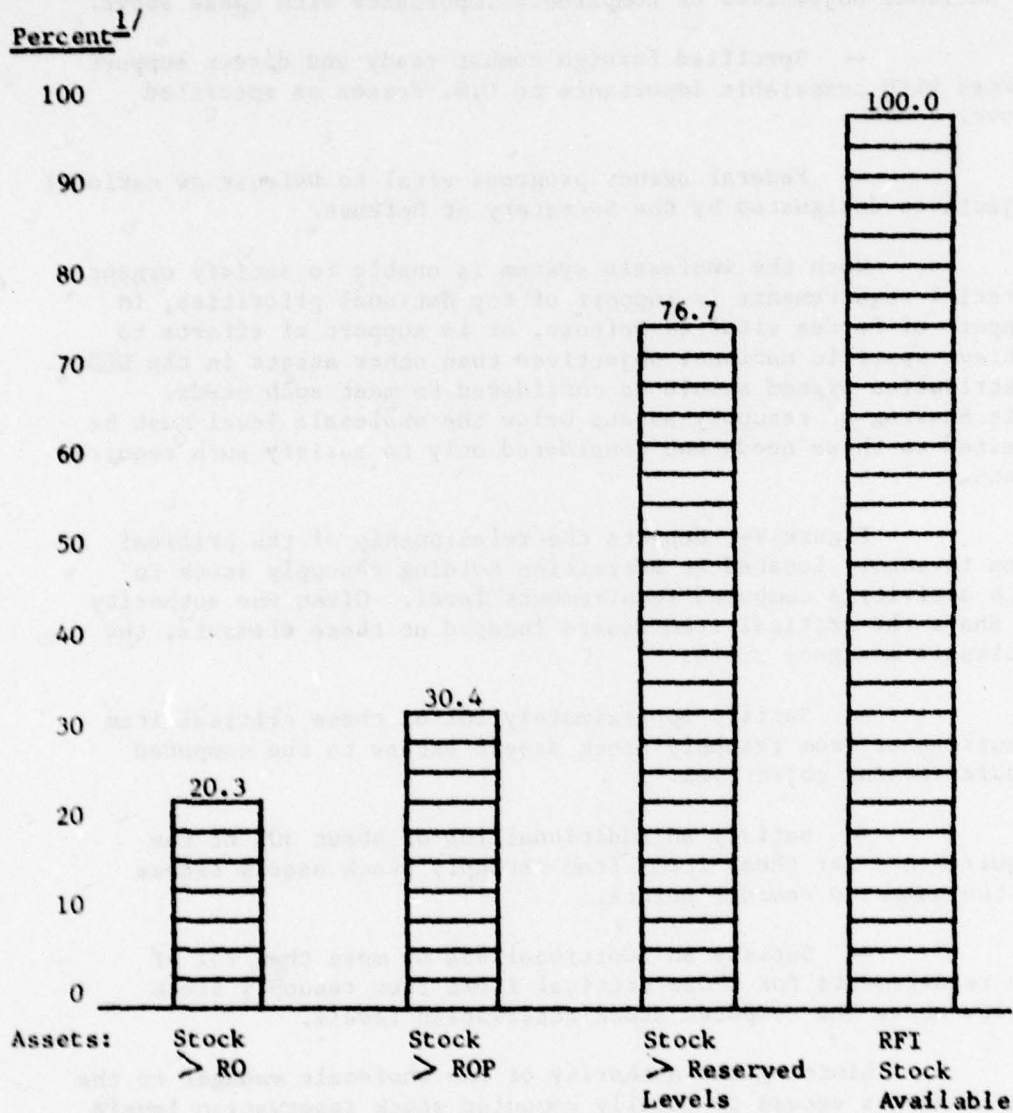
- Satisfy approximately 20% of these critical item requirements from resupply stock assets excess to the computed requisitioning objectives.

- Satisfy an additional 10% or about 30% of the requirements for these items from resupply stock assets excess to the computed reorder points.

- Satisfy an additional 45% or more than 75% of the requirements for those critical items from resupply stock assets above the computed stock reservation levels.

Limiting the authority of the wholesale manager to the use of assets excess to locally computed stock reservation levels to satisfy priority 02 critical item requirements protects the Service elements holding resupply stocks against potential loss of critical item assets positioned for specific mission support needs and employment contingencies. At the same time, limiting Sharing to use of assets excess to reservation levels still makes available to the wholesale manager approximately 75% of the critical item assets located in resupply stocks.

RESUPPLY STOCK ASSETS OF CRITICAL ITEMS



Source: Service Data Submission and Analysis

^{1/} Percentages computed based on the 165 Critical Items reported available at activities holding resupply stocks.

Figure V-1

Critical item requirements citing priority 01 indicates the need is in support of a mission or projects specifically approved by the President or the Secretary of Defense as efforts warranting the best possible DoD logistics backing. This fact, coupled with priority 01 needs representing only 0.04% of the total DoD requirements, make it reasonable and prudent to authorize the wholesale manager access to all critical item assets located in resupply stocks to satisfy priority 01 critical item requirements.

c. Control of Authority

Authority for the wholesale manager to acquire specific quantities of critical item assets from one Service's elements holding resupply stock to satisfy another Service's customer should be granted only after all other reasonable wholesale management options have failed to be responsive in satisfying a critical item requirement. This authority must be carefully controlled by the ICP commander. To verify that all reasonable wholesale management actions are exhausted and in keeping with the mandate that field commanders personally review requirements of the highest Urgency of Need, the ICP commander should validate the need for his item manager to use the Sharing option. The ICP commander's certification would provide him positive control of the use his management staff makes of Sharing and would indicate to commanders of Service elements controlling resupply stock that Sharing in a specific instance is essential to satisfy a critical item requirement.

The ICP commander should anticipate that Service field activities called upon to Share resupply stocks are likely to be skeptical about how they were selected. Therefore, commanders shipping resupply assets under their control to customers having critical item requirements should be aware that their unit was selected as a consignor based on application of basic redistribution rules which consider:

- The relative geographic location of the shipper and the requisitioner,
- The relative levels of supply when two or more potential suppliers are identified,
- The requirement to meet a precise delivery date, and
- The physical capability of the potential supplier to pack and ship the materiel to satisfy the requirement.

4. Mechanism for Asset Control

a. General. The DoD recognizes a need for extending world-wide control over selected items beyond the wholesale distribution system. Critical item asset control is a very limited and select part of that policy. Procedures to implement this policy and other approved DoD special management programs are under development and some can be applied to Sharing of critical items.

b. Current Status

The Components in conjunction with the Military Standard Systems Administrator are evaluating proposed MILSTRIP asset redistribution procedures for the approved DoD Materiel Returns Program (MRP). The procedures, as proposed by the Systems Administrator, are designed to accommodate redistribution of potential DoD excess, but with some modification can provide a mechanism to control Sharing of critical item assets.

Sharing can be directed by using the MILSTRIP "Referral Order;" however, the use of the "Referral Order," is currently restricted to elements assigned "Routing Identifier Codes" in accordance with MILSTRIP. To accommodate critical item Sharing, "Routing Identifier Codes" could be assigned by the Services to all elements controlling resupply stocks or the document format could be modified to accept assigned DODAAD Codes.

c. Asset Control Features. MILSTRIP proposals developed by the Systems Administrator to accommodate redistribution of potential DoD excess feature appropriate concepts for controlling Shared critical items. Some of the more salient characteristics of the proposals needed for managing critical items are: (1) consideration of geographic relationships of asset holder and requiring activity, (2) use of established lines of communication to submit materiel requirements, follow-up and cancellation documents, and (3) use of established techniques for billing, collection and issuing credit. These characteristics are discussed below.

(1) Geographic Relationship

It is reasonable that action to satisfy critical item requirements should be directed to acquiring the available assets closest to the geographic location of the requiring element. In short, the wholesale manager should have a mechanism available to identify the geographic location of a unit submitting a valid

requirement for a critical item. In turn, the mechanism should facilitate selecting activities holding resupply stocks to report assets of the critical item within the same geographic area. Availability of such a mechanism will permit the wholesale manager an option of gaining asset knowledge on a geographic or worldwide basis.

Included in the MILSTRIP proposals is a feature for the wholesale manager to compare requisitions with field reported excesses. Where potential excess holders and requisitioning elements are favorably located to each other geographically, redistribution is to be directed by the wholesale manager. This concept has features desired for a critical item Sharing concept. The proposal indicates that each Component's wholesale management activity will develop and maintain a geographic matrix designed to minimize transportation costs and improve responsiveness of redistribution of DoD potential excesses to satisfy requirements.

To be economically beneficial and provide for more timely critical item support, these geographic matrices need not be so finite that they are impractical to maintain. It is not essential that each operating element be identified with a city, county or state, but that they be associated with larger geographic theaters such as CONUS, Europe, Western Pacific, etc. for improved management of critical items and increased readiness of those forces needing critical item support. DoD publications listing Army Post Offices (APOs) and Fleet Post Offices (FPOs) such as the Air Force Directory of Unclassified Addresses and Standard Navy Distribution List, Part 1, and DODAAD information, which includes Standard Post Location Codes to identify mailing addresses for CONUS activities, could be used in developing geographic matrices. The geographic relationship of an element requiring a critical item to activities reporting resupply stocks of a critical item could be evaluated using such a management tool.

(2) Financial Transactions

The proposed MILSTRIP techniques require the wholesale manager to bill and collect from the customer and provide credit, when appropriate, to the holder of potential excess. These ideas apply fully to critical items management. The ICP remains the customer's source of supply with related supply transactions and lines of communication unchanged. These features assist the wholesale manager with execution of his basic materiel

management role while causing minimum disruption of established supply requisitioning and fiscal procedures.

Activities Sharing critical item assets with other Service elements would receive credit from the wholesale activity with whom credit procedures are established. Timely credit for critical items shipped by activities holding resupply stocks reduces the adverse financial impact on that manager without involving the complexities of interdepartmental billing.

Current DoD Instructions, i.e., DoD Instruction 7420.1, "Regulations Governing Stock Fund Operations," limit credits to materiel received, inspected and recorded in the wholesale managers accountable stock records. For the purpose of billing and issuing credit for critical item requirements satisfied by Sharing, these transactions must be initiated based on materiel shipment and receipt confirmations rather than physical materiel movement and control. Procedures to implement this technique are outlined in Chapter VI, Addendum VI-B.

5. Summary

Service doctrine holds supply to be a function of command, and responsibility and accountability as inherent in command. This is necessary if commanders are to be held responsible for logistic support necessary to accomplish assigned tasks. However, some degree of latitude must be authorized the wholesale manager in control of critical item assets at activities possessing resupply stocks if the manager is to effectively fulfill the materiel management responsibility in meeting field commanders' critical item needs.

To assist with establishing positive control of the use of Sharing and in keeping with the DoD requirement that field commanders verify requirements of the highest Urgency of Need, the ICP commander should certify the need to Share resupply stocks to satisfy validated critical item requirements. In addition, the authority of the wholesale manager to Share critical item assets at activities possessing resupply stocks can be limited to:

- The use of resupply assets only after all reasonable wholesale actions are exhausted;

- The use of resupply assets excess to an activity's reservation level to satisfy priority O2 requirements; and

— The use of resupply assets below reservation levels to satisfy priority 01 requirements only.

Existing techniques and procedures, some supporting other special materiel management programs, are adaptable and acceptable for managing critical items. Still other MILSTRIP techniques and procedures that have been proposed to support new or expanded DoD programs are appropriate for reporting item transactions and status, and controlling critical item assets. In some cases, minor modification or improvements of existing Military standard procedures are needed, but in other instances DoD implementation of current directives and techniques is all that is needed to provide the management tool necessary to control resupply stocks for critical item management.

F. SUMMARY OBSERVATIONS AND CONCLUSIONS

1. The single potentially most productive action to meet critical item requirements for items managed as stocked items is the Sharing of critical item assets at activities holding resupply stocks.

2. Requisites for effectively Sharing DoD assets of critical items are:

a. There must be a means for identifying activities on an interservice basis holding resupply stocks applicable to critical item requirements.

b. There must be a means for determining the quantity of resupply stocks available to meet critical item requirements.

c. Wholesale managers must have the authority to direct redistribution of resupply stocks to meet critical item requirements.

3. In a high percentage of instances (about 35%) serviceable assets of critical items which are managed as stocked items can be located in resupply stocks.

4. To be productive, critical item management must be applied to a very restricted range of items — only items with Priority Designator 01 and 02 requirements and a wholesale serviceable stock position of zero.

5. ICP commanders should be authorized to use resupply stocks to satisfy a critical item requirement when other wholesale management actions cannot provide the same degree of responsiveness.

6. For critical items, wholesale managers should have authority to redistribute assets below wholesale level to meet Priority Designator 01 and 02 requirements. Redistribution authority should be to zero balance for priority 01 requirements and to locally determined reserve levels for priority 02 requirements.

7. Sharing critical item assets located at activities holding resupply stocks among Service customers can be accommodated within existing systems and procedures with minimal system modifications.

CHAPTER VI

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

A. INTRODUCTION

By a memorandum of 20 September 1976, the Assistant Secretary of Defense (Installations and Logistics) requested the Director, Defense Logistics Agency (DLA) to direct the Defense Logistics Analysis Office (DLAO) to conduct a Department of Defense-wide review and analysis with the goal of improving "the management of 'critical items' within the DoD by developing standard policies for the management of these items." Within this overall purpose, the Study Plan for the review and analysis established the following specific objectives:

"1. Develop standard criteria for identifying:

"a. When an item of supply becomes 'critical,' and merits the specialized management attention associated with that designation; and,

"b. When an item of supply should no longer be managed as a critical item.

"2. Develop a single uniform system for the management of critical items, including but not limited to such areas as algorithms for critical item control levels, redistribution criteria, depth and frequency of inventory data reporting, data interchange requirements, specialized requisition processing, use of premium transportation, intensified maintenance management, and urgent procurement actions."

An initial review of Component directives, policies, and instructions coupled with Component headquarters level briefings highlighted, among other things, the following key, preliminary observations and conclusions:

— The current Joint Chiefs of Staff (JCS) Pub 1 "critical item" definition is imprecise and variously interpreted by Department of Defense (DoD) Components.

— The current "critical item" definition encompasses two subsets of items: (1) "Critical Items" and (2) "Potentially

Critical Items." The former subset includes items that are in a poor asset status causing severe support problems; the latter subset includes a much broader range of items for which support trouble can be expected.

- A DoD-wide critical item recognition and management system does not exist. Only the Air Force has a special item management system called a "Critical Item Program." However, each Component has one or more special management programs for the selective, intensive management of items; most of these programs contain a means for identifying and applying special attention to items considered "critical."

- The Inventory Control Points (ICPs) of each Component have a wide range of management actions for avoiding or overcoming short supply and critical supply status. Review of these actions as applied by item managers would reveal (1) precise criteria for uniformly identifying items which should be designated critical and (2) the management actions most appropriately applied when a critical item situation occurs.

Recognition of these factors had a significant impact on the study approach. The field research, data collection, and analyses for the Study were oriented, extensively, toward confirming or refuting these preliminary observations and conclusions. The results are outlined in the following paragraphs.

B. SPECIAL ITEM MANAGEMENT SYSTEMS

Among the DoD Components special materiel and readiness management systems, subsystems, and programs identified for review were those designated to:

- Identify supply items contributing significantly to degraded readiness;
- Identify operational programs or equipments being adversely impacted by supply system failures;
- Improve use of assets and accommodate financial restraints; and
- Give optimum attention to categories of items having the greatest demands, consuming the greatest volume of resources, or indicating the greatest potential of becoming deficient.

Collectively, these special programs encompass the "selective" and "intensive" item management programs used by nearly all materiel managers, including those labeled critical item management programs by some materiel managers.

A review of approximately 20 special management systems, subsystems, and programs designed to identify and take support action for selected items, including "critical" items, indicates that:

1. Each DoD Component having item management responsibility has a basic system designed for the management of secondary items of supply and, in addition, one or more special programs for the "selective" or "intensive" management of items having certain characteristics or attaining a certain supply status.
2. Each of the Selective Item Management and Intensive Item Management Programs augments the basic Component or ICP item management system with special information, actions, or controls and is designed to avoid or overcome an undesirable supply situation.
3. Over 200,000 items are identified and controlled within the several intensive item management programs of the DoD.
4. Each Military Service has an operational readiness support program to monitor and expedite wholesale management satisfaction of urgent requirements, including critical equipments and end items, and components and parts critical to their operation.
5. Generally, the special management programs for operational readiness support have features aimed at recognition of short supply situations or potential short supply situations which will adversely impact operational readiness.
6. Certain Selective Item Management Programs provide for asset visibility and control beyond the wholesale level on an intraservice basis; however, only one of the special item management programs provides for potential supply source data on an interservice or DoD-wide basis and none provides for wholesale item manager control of assets below the wholesale level.
7. Currently, "critical" items are not exclusively defined or identified DoD-wide, but may be managed within any of the various selective item management programs.

C. CRITICAL ITEM DEFINITION

The current JCS Pub 1 definition for a critical item is:

"An essential item which is in short supply or expected to be in short supply for an extended period."

The Memorandum forwarding the Study Assignment stated that "criteria for designating an item as being in a 'critical' supply status...vary from Component to Component...and from Inventory Control Point (ICP) to ICP within certain Components." While all Components and ICPs expressed an awareness of the JCS Pub 1 definition, the contention of vagueness and the need for more precise, uniform criteria were confirmed during the reviews of special management systems and item management processes. Information accumulated from Component and ICP publications, on-site research, and special data calls was used to conduct analyses aimed at determining:

- Why the current definitions for critical items are deficient;

- Whether the physical or materiel management characteristics of an item can be used to identify critical items or potentially critical items; and

- How to identify more precisely and uniformly a manageable range of critical items.

These analyses indicate that:

1. There are currently several special management programs designed to preclude items from reaching "critical supply status." In spite of these various systems, some items, because of nonavailability, cause serious support problems — these items are in a "critical supply status" and, thus, are "critical items."

2. The official and unofficial critical item definitions currently used by item managers variously interpret and apply the imprecise JCS Pub 1 critical item criteria of "essential item," "in short supply," and "expected to be in short supply for an extended period."

3. The current critical item definition includes two distinct categories of items: (1) items approaching a critical supply status and (2) items in a critical supply status. The former

category contains a broad range of items which are difficult to identify; the latter category is composed of a relatively restricted number of items which can be described and identified at any given point in time. These two categories should be identified and handled separately.

4. Item characteristics, such as unit price, annual demand, or reparability, do not provide the means to identify critical items.

5. Certain factors related to an item, such as (a) the item's application, (b) the mission essentiality of the force/activity supported by the item, (c) the urgency of need for the item, and (d) the item's asset status, do influence a criticality determination.

6. The term "Critical Item" should be applied only to items for which (a) a Priority Designator 01 or 02 requirement is known and (b) the serviceable asset status is zero at the wholesale management level. Application of these criteria to items across the DoD will result in a precise, consistent identification of a relatively small number of items to which the application of extraordinary management effort is most desirable.

7. While Critical Items, as identified above, definitely merit supra-management attention, other items identified as vital to the support of mission essential equipments and end items have the potential of becoming critical items and, therefore, may require special management attention within one of the currently established intensive item management programs. That is, the establishment of a DoD-wide management program for critical items would not be a replacement for the various selective, intensive item management programs currently used.

D. MANAGEMENT ACTIONS FOR AVOIDING OR VOIDING CRITICAL ITEM STATUS

The identification of critical items based on this precise set of criteria — Priority Designator (PD) 01 or 02 requirements in hand and a zero balance on hand — also identifies a most serious logistics support situation wherein the asset status of an item is causing an essential mission to abort. Such a logistics situation justifies intense action. As a result, a series of analyses were undertaken to ascertain the

range of actions taken when potential or actual short supply situations are recognized, the frequency and general effectiveness of the actions, and the identity of any special actions which are most applicable to critical item situations. These analyses indicated that:

1. Generally, the actions taken by a wholesale item manager to alleviate critical supply status are the same actions taken to avoid critical supply status or even short supply status. However, when an item is considered critical, the actions may be applied with more intensity.

2. Wholesale management actions taken most frequently for items in short supply, including critical items, are:

- Expedited procurement and maintenance;
- Borrowing and issuing war reserve stock; and
- Normal replenishment coupled with the establishment of high priority backorders.

Other actions taken with less frequency are:

- Redistribution of below wholesale level assets;
- Technical review leading to selective issue alternatives; and
- Cannibalization and issue.

3. The judicious application of each of the actions currently applied has merit in maintaining effective materiel support; and avoiding short and critical supply support situations can depend on any or all of the actions.

4. Within the foreseeable future the establishment of "control levels" is not likely to be an effective technique for avoiding critical item status.

5. When a critical item status, as prescribed in Chapter III, is recognized, two extraordinary actions which should be considered immediately as possible means of filling critical requirements are:

— Querying the Defense Property Disposal Service (DPDS) for assets; and/or

— Attempting to locate and redistribute below wholesale level assets.

Of these extraordinary actions, redistribution of below wholesale level assets offers the greatest potential for meeting a critical item requirement quickly.

E. STOCKED VERSUS NONSTOCKED ITEMS

To estimate the range of items which could be critical at a given point in time based on application of the critical item definitions, an analysis was conducted using data from Defense Logistics Service Center (DLSC), Defense Automatic Addressing System Office (DAASC), and Military Supply and Transportation Evaluation Procedures (MILSTEP) Reports. The data indicated that about 35,000 items would have been categorized as critical on 30 June 1977. This total is composed of about 7,000 (20%) stocked items and 28,000 (80%) items managed as nonstocked.

Since the decision to manage an item without stock is made during provisioning, it is preordained that a mission-essential support item managed without stock will become a critical item when a Priority Designator 01 or 02 requirement is generated. When this happens two actions are necessary: first, a supply action (generally a purchase action) is initiated; and second, a decision whether to continue to manage the item without stock or to change the item's designation to "stock" is made.

When the decision is to buy, the action is taken as expeditiously as possible and requires no further analysis within this Study. Decisions regarding stockage versus nonstockage are beyond the scope of this Study. Therefore, further analysis of the nonstocked items was not pursued, and the search for extraordinary supply actions to overcome critical item situations was limited to items managed as stocked items.

F. SHARING DoD CRITICAL ITEM ASSETS

Having concluded that redistribution of below wholesale level assets offers potential for meeting critical item requirements quickly, it was necessary to ascertain the extent of the potential and techniques which could be used to attain that potential. Analyses aimed at these objectives indicate that:

1. The single potentially most productive action to meet critical item requirements for items managed as stocked items is the Sharing of critical item assets at activities holding resupply stocks.

2. Requisites for effectively Sharing DoD assets of critical items are:

a. There must be a means for identifying activities holding resupply stocks applicable to critical item requirements.

b. There must be a means for determining the quantity of resupply stocks available to meet critical item requirements.

c. Wholesale managers must have the authority to direct redistribution of resupply stocks to meet critical item requirements.

3. In a high percentage of instances (about 35%) serviceable assets of critical items which are managed as stocked items can be located in resupply stocks.

4. To be productive, critical item management must be applied to a very restricted range of items — only items with Priority Designator 01 or 02 requirements and a wholesale serviceable stock position of zero.

5. ICP commanders should be authorized to use resupply stocks to satisfy a critical item requirement when other wholesale management actions cannot provide the same degree of responsiveness.

6. For critical items, wholesale managers should have authority to redistribute assets below wholesale level to meet Priority Designator 01 and 02 requirements. Redistribution authority should be to zero balance for priority 01 requirements and to locally determined reserve levels for priority 02 requirements.

7. Sharing critical item assets located at activities holding resupply stocks among Service customers can be accommodated within existing systems and procedures with minimal system modifications.

G. MAJOR CONCLUSIONS

Within the summary observations and conclusions, there are a few which are most significant and directly related to the specified objectives of the Study. These major conclusions are:

1. A critical item should be defined as follows:

A CRITICAL ITEM IS AN ITEM OF SUPPLY FOR WHICH (a) A PRIORITY DESIGNATOR 01 OR 02 REQUIREMENT IS KNOWN BY A WHOLESALE MANAGER AND (b) THERE ARE ZERO SERVICE-ABLE STOCKS OF THE REQUIRED ITEM AT THE WHOLESALE LEVEL.

2. When a Critical Item is identified, a materiel manager should immediately:

- Assure that all potentially useful routine and special materiel management actions (including expediting) have been taken to avoid or overcome the critical item situation;

- Query the Defense Property Disposal Service in search of excess serviceable assets of the item; and

- When these actions do not generate positive, timely results, initiate action to locate and redistribute below wholesale level assets.

3. Policy and procedures to facilitate the Sharing of critical item resupply assets held at locations below the wholesale level should be established.

H. RECOMMENDATIONS

In view of the foregoing findings, analyses, and conclusions, it is recommended that:

1. THE SECRETARY OF DEFENSE OR DEPUTY SECRETARY OF DEFENSE APPROVE AND PUBLISH THE PROPOSED DEPARTMENT OF DEFENSE DIRECTIVE 4140.XX, CRITICAL ITEM MANAGEMENT, (ADDENDUM VI-A) WHICH:
 - PROVIDES A PRECISE, UNIFORM DEFINITION OF A CRITICAL ITEM;
 - PRESCRIBES A SET OF POLICIES FOR CRITICAL ITEM MANAGEMENT; AND
 - DELINEATES RESPONSIBILITIES FOR THE PERFORMANCE OF CRITICAL ITEM MANAGEMENT TASKS.

2. THE ASSISTANT SECRETARY OF DEFENSE (MANPOWER, RESERVE AFFAIRS, AND LOGISTICS) DIRECT THE MILITARY STANDARD SYSTEMS ADMINISTRATOR TO EFFECT THE MILITARY STANDARD SYSTEMS MODIFICATIONS LISTED IN ADDENDUM VI-B AND UPON COMPLETION OF THIS TASK PUBLISH THE SHARING PROCEDURES OUTLINED IN ADDENDUM VI-B AS SEGMENTS OF THE MILITARY STANDARD REQUISITIONING AND ISSUE PROCEDURES AND THE MILITARY STANDARD TRANSACTION REPORTING AND ACCOUNTING PROCEDURES.



ADDENDUM VI-A

NUMBER 4140.XX (Proposed)

Department of Defense Directive

SUBJECT Critical Item Management (CIM)

- Refs.:
- (a) DoD Instruction 4140.24, "Requirements Priority and Asset Application for Secondary Items," September 10, 1969
 - (b) DoD 4140.22-M, "Military Standard Transaction Reporting and Accounting Procedures," (MILSTRAP) January 3, 1977
 - (c) DoD 4140.17-M, "Military Standard Requisitioning and Issue Procedures," (MILSTRIP) August 31, 1976

I. PURPOSE AND OBJECTIVE

This Directive sets forth a definition for Critical Items, establishes Critical Item Management (CIM) policy, and assigns responsibilities for performance of CIM tasks. The purpose of the CIM program is to identify items having a severe, adverse impact on essential Department of Defense (DoD) mission accomplishment because of their asset status and to provide the wholesale materiel manager with an additional management option to satisfy the Critical Item requirement.

II. APPLICABILITY

- A. The provisions of this Directive apply to the Military Departments and the Defense Logistics Agency (hereafter referred to as DoD Components).
- B. The provisions of this Directive apply to secondary items of supply as defined in reference (a).

III. DEFINITIONS

These definitions are essential elements of CIM. They are:

- A. Critical Item. A Critical Item is an item of supply for which (a) a Priority Designator 01 or 02 requirement is known by a wholesale manager and (b) there are zero serviceable wholesale level stocks of the required item.
- B. Resupply Stocks. Resupply stocks are assets positioned below the wholesale level in support of consumer units, activities, or a geographic area; they are not assets positioned for immediate end use.
- C. Sharing. Sharing is the location and redistribution of resupply stock to meet a critical item requirement when other wholesale management actions cannot provide the same degree of responsiveness.

IV. POLICIES

A. General

- 1. At the present time, wholesale managers maintain *asset knowledge and control over supply items* in the wholesale distribution system, and over some selected items below the wholesale level on an intraservice basis. Under the provisions of this Directive the wholesale manager will extend Critical Item asset knowledge and control below the wholesale level on a DoD-wide basis.
- 2. CIM is a supra-management program and will apply only to Critical Items as defined in paragraph III. The CIM Program will use Sharing as defined in paragraph III as an extraordinary means for filling requirements causing severe, adverse impact on essential DoD mission accomplishment.

B. Item Management

- 1. Under the supervision of the Secretaries of the Military Departments or the Director, Defense Logistics Agency, Inventory Control Points will extend Critical Item asset knowledge to Service elements holding resupply stocks. Among the elements holding resupply stocks are:

- a. Army - Installation Supply Activities, Theater Depots, General Support Units, and Direct Support Units.
 - b. Navy - Nontransaction Item Reported stock at Stock Point Activities, Mobile Logistic Support Force (stocks carried for issue), aircraft carriers and other major surface ships with Aviation Consolidated Allowance List and Consolidated Shipboard Allowance List stocks.
 - c. Air Force - Base Supply Activities, and Air Logistics Center Retail Supply Accounts.
 - d. Marine Corps - Installation Direct Support Stock Control Activities, Air Station Supply Departments, Force Service Support Groups, and Marine Air Groups.
2. Wholesale managers certifying that Sharing is essential to satisfy Critical Item needs will use serviceable resupply stock assets exceeding locally computed stock reservation levels to satisfy Uniform Materiel Movement and Issue Priority System (UMMIPS) Priority 02 requirements and all serviceable resupply stock assets to satisfy Priority 01 requirements.
 3. Commanders of operational elements holding resupply stocks of critical items will redistribute such stocks to meet critical item requirements unless redistribution will preclude accomplishment of the operational element's mission.
 4. Should an operational commander conclude that an Inventory Control Point's Critical Item redistribution action precludes accomplishment of an operational element's mission; the commander will inform the wholesale manager that the materiel cannot be redistributed.
 5. Critical Item asset reporting and redistribution procedures will be developed and published in references (b) and (c).

C. Financial Management

1. Wholesale managers will provide credit to elements providing Critical Item assets from resupply stocks.

2. The cost of shipment preparation and transportation will be an operating expense of the element providing Critical Item support.

V. RESPONSIBILITIES

- A. The Assistant Secretary of Defense (Manpower, Reserve Affairs and Logistics) (ASD(MRA&L)) will:
 1. Monitor and maintain the policies regulating management of Critical Items.
 2. Assure the effective development, implementation, and use of CIM procedures, including the revision of references (b) and (c).
- B. The Assistant Secretary of Defense (Comptroller) (ASD(COMP)) will:

Collaborate with ASD(MRA&L) in the development and maintenance of procedures to effect wholesale manager's billing and issuing credit for Critical Item asset redistribution among Component elements below the wholesale level.
- C. The Secretaries of the Military Departments or their designees and the Director of the Defense Logistics Agency will:
 1. Develop and publish their respective Component procedures to implement the provisions of CIM.
 2. Develop and submit to the ASD(MRA&L) their respective Component positions on proposals to revise CIM processes.

VI. EFFECTIVE DATE AND IMPLEMENTATION

- A. This Directive is effective immediately.
- B. Publication of implementing MILSTRIP and MILSTRAP procedures for CIM which constitute operational implementation of this Directive will be accomplished by (date).

SECRETARY or
DEPUTY SECRETARY OF DEFENSE

ADDENDUM VI-B

TECHNIQUES TO EFFECT SHARING

A. INFORMATION

This Addendum deals with a critical item, as defined in Addendum VI-A, which has a requirement that cannot be satisfied by any wholesale management option except Sharing resupply stocks. Sharing critical item assets located at elements holding resupply stocks with a customer having a critical item requirement requires definite procedures. Basic steps in this process are:

- Asset Location,
- Asset Availability Determination,
- Asset Redistribution, and
- Financial Adjustment.

Many approved Military Standard management techniques exist and other procedures have been proposed in support of new Department of Defense (DoD) management programs. With certain modifications or additions they can accommodate critical item management. Existing applicable Military Standard procedures and required additions or modifications to current and proposed Military Standard Systems are presented in this Appendix.

B. ASSET LOCATION

1. Procedure

a. The Inventory Control Point (ICP) Commander will:

- Personally review and approve the need to acquire critical item asset knowledge from Service elements controlling resupply stocks.

b. The Wholesale Manager will:

- Prepare a Military Standard Transaction Reporting and Accounting Procedures (MILSTRAP) "Asset Status Reporting

Request" to request critical item asset visibility at elements holding resupply stocks.

- Transmit the Request by the most expeditious communication mode to the processing Service Central Point in accordance with MILSTRAP.

c. The Service Central Point will:

- Select Service elements holding resupply stocks that are likely to hold assets of the needed critical item.

- Transmit the asset status request to selected elements holding resupply stocks by the most expeditious communication mode.

2. Additions Required

- "Routing Identifier Codes" must be assigned by the Services to all elements holding resupply stocks or,

- "DODAAD Codes" assigned to elements holding resupply stocks must be accommodated in the MILSTRAP "Asset Status Reporting Request."

3. Modification Required

- MILSTRAP asset reporting procedures must apply to all secondary items when designated critical.

- Processing of critical item asset status requests must be commensurate with the short time frames appropriate for priority 01 and 02 requisitions.

C. ASSET AVAILABILITY

1. Procedures

a. The Elements Holding Resupply Stock will:

- Report requested critical item assets by preparing the MILSTRAP "Asset Status Report."

— Transmit the Report by the most expeditious communication mode to the requesting wholesale manager initiating the "Asset Status Reporting Request."

2. Additions Required

— "Routing Identifier Codes" must be assigned by the Services to all elements holding resupply stocks or,

— "DODAAD Codes" assigned elements holding resupply stocks must be accommodated in the MILSTRAP "Asset Status Report."

3. Modification Required

— Reporting of critical item asset status by elements holding resupply stocks must be expedited so that reporting time is commensurate with the priority associated with critical item requirements.

D. ASSET REDISTRIBUTION

These actions will be taken to satisfy a critical item requirement when resupply stocks of the critical item are available and other wholesale management options have failed to meet the need.

1. Procedures

a. The ICP Commander will:

— Personally review and certify the selection of the activity to provide critical item support.

b. The Wholesale Manager will:

— Prepare a Military Standard Requisitioning and Issue Procedures (MILSTRIP) "Referral Order" to direct shipment of critical item resupply stock assets.

— Transmit the "Referral Order" by the most expeditious communication mode to the Service element selected to Share a critical item asset with a customer having a critical item requirement.

— Prepare and transmit to the requisitioner a MILSTRIP "Supply Status" document citing status to reflect that:

- (1) The critical item requirement was referred to an activity holding resupply stocks.
- (2) Follow-up requests will be directed to the wholesale manager, and
- (3) A MILSTRAP "Materiel Receipt" for property received is required to be submitted by the requisitioner to the wholesale manager.

— Assure that elements sent "Referral Orders" to ship critical items furnish the wholesale manager appropriate MILSTRIP status.

— Transmit to the requisitioner the MILSTRIP shipment status provided by the critical item asset holding activity.

— Prepare and transmit a MILSTRIP "Referral Order" to a second element holding critical item resupply stock assets if the original request is rejected by a Commander who determines release of the assets will preclude accomplishment of his element's assigned mission.

— Assure that requisitioners supported from critical item assets at elements holding resupply stocks furnish the wholesale manager an appropriate MILSTRAP "Materiel Receipt."

c. The Element Holding Resupply Stock will:

— Prepare and ship the required critical item to the requisitioner by the most expeditious transportation mode.

— Provide complete MILSTRIP supply and shipment status to the wholesale manager.

— Prepare and submit to the wholesale manager a MILSTRIP requisition citing the highest priority authorized the element shipping a critical item if replacement of the shipped item is desired.

d. The Commander of Elements Holding Resupply Stock will:

— Review and certify rejected "Referral Orders" for critical items as "rejected - release of required assets will preclude accomplishment of this operational element's mission."

e. The Requisitioner receiving critical item support from elements holding resupply stocks will:

— Report property receipt to the wholesale manager using the MILSTRAP "Materiel Receipt."

2. Additions Required

— "Routing Identifier Codes" must be assigned by the Services to all elements holding resupply stocks or,

— "DODAAD Codes" assigned elements holding resupply stocks must be accommodated in the MILSTRIP "Referral Order" and "Supply Status," and MILSTRAP "Materiel Receipt."

— Development of a MILSTRIP "Status Code" to show:

- (1) The critical item requirement was referred to an activity holding resupply stocks,
- (2) Follow-up requests will be directed to the wholesale manager,
- (3) The requisitioner will submit a MILSTRAP "Materiel Receipt" upon receipt of this item.

— Development of a MILSTRIP "Advice Code" to show that a "Referral Order" for a critical item is rejected by a Commander who determined that release of the asset would preclude operational mission accomplishment.

E. FINANCIAL ADJUSTMENTS

1. Procedures

a. The Wholesale Manager will:

— Bill requisitioners for critical item assets provided from elements holding resupply stocks. Billing will be initiated when the shipper notifies the wholesale manager "item being processed for release and shipment."

— Issue credit to elements providing critical item assets from resupply stocks. Credit will be initiated when the

requisitioner reports to the wholesale manager that the item was received.

2. Additions Required

— "Routing Identifier Codes" must be assigned by the Services to all elements holding resupply stocks or,

— "DODAAD Codes" assigned elements holding resupply stocks must be accommodated in the MILSTRIP "Supply Status" and MILSTRAP "Materiel Receipt."

3. Modification Required

— DoDI 7420.1, "Regulations Governing Stock Fund Operations," must be modified to permit the wholesale manager to bill and provide credit for materiel not actually received, inspected, recorded in the accountable stock records, and subsequently issued from the stock fund.

APPENDIX A



SR

INSTALLATIONS AND LOGISTICS

ASSISTANT SECRETARY OF DEFENSE
WASHINGTON, D.C. 20301

20 Sep 1976

MEMORANDUM FOR THE ASSISTANT SECRETARY OF THE ARMY (I&L)
ASSISTANT SECRETARY OF THE NAVY (I&L)
ASSISTANT SECRETARY OF THE AIR FORCE (I&L)
DIRECTOR, DEFENSE SUPPLY AGENCY

SUBJECT: Management of Critical Items

Criteria for designating an item as being in a "critical" supply status and methodology for managing items so designated vary from Component to Component within the Department of Defense (DoD) and from Inventory Control Point (ICP) to ICP within certain Components. The degree of special management and the organizational level to which such special management is extended also vary between Components.

The substantial number of items now managed by Integrated Managers requires greater consistency in designating and managing critical items than now exists. The enclosed Study Plan sets forth the objectives of a review and analysis of critical item management within the DoD and prescribes an approach toward the development of a DoD Issuance which will promulgate critical item management policy.

The Director, Defense Supply Agency is requested to direct the Defense Logistics Analysis Office (DLAO) to conduct such review and analysis in accordance with the enclosed Study Plan.

Inasmuch as all addressees have an interest in the accomplishment of this review, your special attention is directed to Paragraphs G through I of the Study Plan which establish a need for Military Service and DSA contact points, headquarters level briefings and, ultimately, on-site research and data collection.

/s/ Frank A Shrontz
/t/ FRANK A SHRONTZ
Assistant Secretary of Defense
(Installations and Logistics)

Enclosure
As Stated

STUDY PLAN
for
A DoD REVIEW AND ANALYSIS OF
CRITICAL ITEM MANAGEMENT

A. PURPOSE

To improve the management of "critical items" within the DoD by developing standard policies for the management of these items.

B. OBJECTIVES

1. Develop standard criteria for identifying:

a. When an item of supply becomes "critical," and merits the specialized management attention associated with that designation; and,

b. When an item of supply should no longer be managed as a "critical item."

2. Develop a single uniform system for the management of critical items, including but not limited to such areas as algorithms for critical item control levels, redistribution criteria, depth and frequency of inventory data reporting, data interchange requirements, specialized requisition processing, use of premium transportation, intensified maintenance management, and urgent procurement actions.

C. SCOPE

The findings and recommendations of this study will apply to secondary items of supply (as defined in DoDI 4140.24) under the wholesale management of the Military Services or DSA. This review will include appropriate aspects of critical item management at all echelons of supply, including wholesale, intermediate, and consumer levels.

"Critical items" and "critical item management" as used in this Study Plan applies only to those items which receive special management attention because of their supply status-- i.e., this study is limited to the specialized management actions applied to items which are in short supply.

Although this study is concerned with the management of critical items, research may also be required in other areas not directly involved in the specialized management of critical items, in order to provide background and perspective for the Study Team.

D. STUDY APPROACH

1. Review existing publications, reports, studies, and directives pertaining to the identification and management of critical items.
2. Obtain briefings from the Military Services and DSA regarding the nature and coverage of their programs for the management of critical items.
3. Identify, through on-site field research at a representative range of logistics and user activities of the Military Services and DSA:
 - a. Criteria used to identify when items qualify for critical item status;
 - b. Methodologies and techniques applied to the management of critical items; and,
 - c. Criteria used to identify when items are no longer subjected to critical item management.
4. Collect summary and line item data pertaining to critical items.
5. Recommend standard policies, or a single set of criteria, for identifying:
 - a. When items become eligible for critical item status; and,
 - b. When items should be removed from critical item status.
6. Recommend standard specialized methodologies and techniques to be used in the management of critical items, including but not limited to consideration of the following areas:
 - a. Control levels;
 - b. Depth and frequency of inventory data reporting;
 - c. Data interchange requirements;
 - d. Redistribution criteria;
 - e. Specialized requisition processing;
 - f. Use of premium transportation;

g. Intensified maintenance management; and,

h. Expedited procurement processing.

7. Submit to the OASD(I&L) a draft directive including the policies, criteria, and methodology for critical item selection and management.

E. TEAM COMPOSITION AND ADMINISTRATION

The Study Team will be composed of three full-time members of the Defense Logistics Analysis Office (DLAO) including a Team Director.

The Study Team will receive administrative support from the DLAO and DSA Administrative Support Center in accordance with ongoing arrangements. TDY expenses will be provided by the home office of the individual team members.

F. SCHEDULE

The Study Team will submit its final report approximately nine months after receipt of the study assignment. A preliminary study schedule allocating this 9-month period is shown in Enclosure 1 to this plan.

G. DATA REQUIREMENTS

Line item and summary statistical data may be required to be submitted by the Military Services and DSA pertaining to the identification and management of critical items. Any such requirements will be made the subject of correspondence directly from the Study Team to the DoD Component(s) involved.

Costs involved in the development and submission of any data requirement established by the Study Team will be borne by the submitting DoD Component. Costs involved in the analysis of any such data will be borne by the DLAO and the DSA Administrative Support Center.

H. FIELD RESEARCH ITINERARY

A representative range of DoD activities (both in the wholesale supply system and at user level) will be visited, to observe critical item management processes on-site. This will include visits to such activities as inventory control points, depots, transportation terminals, purchasing offices, and operating level activities.

A detailed itinerary will be developed by the Study Team. As indicated in the attached schedule, specific activities to be visited will be selected after initial briefings have been received. These selections, and the timing of visits, will be coordinated with the headquarters of the DoD Components involved; this coordination will be accomplished through the respective contact points designated in accordance with Paragraph I below. Notice of the activities to be visited and the timing of the visits will be furnished to the contact points as soon as available, but not less than one week prior to the desired date of the visit.

I. CONTACT POINTS

Each Military Service and the Defense Supply Agency will designate an individual to serve as point of contact with the Study Team. This individual will be responsible for providing, or arranging for, required data and briefings, and for furnishing assistance in arranging visits, as necessary.

The name, organization, and telephone number of contact points will be furnished to the Defense Logistics Analysis Office within fifteen days of the date of the memorandum approving this Study Plan. Notification to the DLAO may be by telephone at 274-6283 (Autovon 284-6283).

The OSD Project Officer for this assignment is Mr. George D. Minter, OASD(I&L)(SR), 697-0345.

APPENDIX B

ACTIVITIES VISITED

Army

U. S. Army Missile Readiness Command, Huntsville, Alabama
U. S. Army Troop Support and Aviation Readiness Command, St. Louis,
Missouri

Navy

Ships Parts Control Center, Mechanicsburg, Pennsylvania
Aviation Supply Office, Philadelphia, Pennsylvania

Air Force

San Antonio Air Logistics Center, San Antonio, Texas

Marine Corps

Marine Corps Logistics Support Base Atlantic, Albany, Georgia

Defense Logistics Agency

Defense Electronics Supply Center, Dayton, Ohio
Defense Industrial Supply Center, Philadelphia, Pennsylvania
Defense Automatic Addressing System Office, Dayton, Ohio

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APPENDIX C

ACTIVITIES SUBMITTING DATA FOR
CRITICAL ITEM MANAGEMENT STUDY

<u>Service</u>	<u>Activity</u>	<u>Echelon of Supply</u>
ARMY	Anniston Army Depot	Depot Maintenance Property Account
	Fort Bragg	Installation Supply Account Corps Support Command
	Corpus Christi Army Depot	Depot Maintenance Property Account
	Director, Industrial Operations, Sagami, Japan	SDA Installation Supply Support
	Materiel Management Agency - Europe, Zweibrucken, Germany	Inventory Control Agency
	Missile Support Element, Pyong-Taek, Korea	SRA (Accountable Officer)
	Fort Sill	Installation Supply Account
	1st Armored Division, Germany	Direct Support Units
	2nd Infantry Division, Korea	Direct Support Units
	3d Infantry Division, Germany	Direct Support Units
	7th Army Training Command, Germany	Direct Support Units
	122d Maintenance Battalion, Germany	Direct Support Units

Appendix C, page 1

<u>Service</u>	<u>Activity</u>	<u>Echelon of Supply</u>
ARMY	512th Maintenance Company, Germany	Direct Support Units
NAVY	Air Rework Facility, Cherry Point	Supply Department
	Air Station, Lemoore	Supply Department
	Air Station, Oceana	Supply Department
	Supply Center, Charleston	Supply Center
	Supply Depot, Yokosuka, Japan	Supply Depot
	Ship Yard, Long Beach	Supply Department
	Ship Yard, Philadelphia	Supply Department
	USS Dixie (AD-14)	Load List/COSAL
	USS Guadalcanal (LPH-7)	AVCAL/COSAL
	USS Kitty Hawk (CV-63)	AVCAL/COSAL
	USS San Diego (AFS-6)	Load List/COSAL
	USS Vulcan (AR-5)	Load List/COSAL
AIR FORCE	Air Force Base, Barksdale	Base Supply Account
	Air Base, Bentwaters, England	Base Supply Account
	Air Force Base, Bergstrom	Base Supply Account
	Air Base, Bitburg, Germany	Base Supply Account
	Air Force Base, Castle	Base Supply Account
	Air Base, Clark, Philippines	Base Supply Account

<u>Service</u>	<u>Activity</u>	<u>Echelon of Supply</u>
AIR FORCE	Air Force Base, Dover	Base Supply Account
	Air Force Base, Elmendorf Alaska	Base Supply Account
	Air Force Base, Ent	Base Supply Account
	Air Force Base, Hickam, Hawaii	Base Supply Account
	Air Force Base, Langley	Base Supply Account
	Air Force Base, Little Rock	Base Supply Account
	Air Force Base, Mather	Base Supply Account
	Air Force Base, Minot	Base Supply Account
	Air Force Base, Randolph	Base Supply Account
	Air Force Base, Sheppard	Base Supply Account
	Air Force Base, Travis	Base Supply Account
MARINE CORPS	First, Force Service Support Group	Supported Activities Supply System
	Marine Corps Logistics Support Base - Atlantic	Direct Support Stock Control Activity
	Marine Corps Base, Camp Lejeune	Direct Support Stock Control Activity

APPENDIX D

DETERMINATION OF THE NUMBER OF CRITICAL ITEMS AS OF 30 JUNE 1977

A. INTRODUCTION

Current management information systems do not provide the number of critical items which meet the critical item criteria recommended by this Report. As a result, information provided by the Defense Logistics Services Center (DLSC), the Defense Automatic Addressing System Office (DAASO), and Military Supply and Transportation Evaluation Procedures (MILSTEP) Reports was used to develop an estimate of the number of secondary items which would meet the critical item criteria at a given point in time. The estimate is as of 30 June 1977.

The purpose of this Appendix is to explain the methodology used to arrive at the estimated number of critical items shown in Table III-8 of this Report.

B. NUMBER OF SECONDARY ITEMS

Table D-1 is an extract from the 30 June 1977 DLSC-IMSS-9A RCS:DSA(Q)1739-9(S) Report titled "Assigned Classes - By Department - Normal Method of Acquisition and Stockage Status Combination Codes."

Table D-1

NUMBER OF DoD MANAGED ITEMS (30 JUNE 1977)

Item Category	Stocked	Nonstocked	Total
Consumables	2,668,850	607,982	3,276,832
Principal End Items & Repairables	400,272	48,981	449,253
Total	3,069,122	656,963	3,726,085

Source: DLSC-IMSS-9A; RCS(Q)1739(S)

Table D-1 contains total item data. To determine the number of secondary items, it was necessary to calculate the number of stocked and nonstocked reparables and principal end items separately and then delete the principal end items from the total item data. To arrive at these numbers, it was necessary to use data from Table V-1, "Wholesale Management - NSNs Assigned by Major ICP," Volume I, Compendium of Inventory Control Point Management Information, November 1974. This table shows the following:

- a. Total Number of End Items - 139,464
- b. Number of Stocked End Items - 77,977
- c. Total Number of Reparables - 373,026
- d. Number of Stocked Reparables - 363,347

Subtracting b from a yields the Number of Nonstocked End Items.

- e. Number of Nonstocked End Items - 61,487

Subtracting d from c yields the Number of Nonstocked Reparables.

- f. Number of Nonstocked Reparables - 9,679

The percentage of Stocked Reparables is determined as follows:

$$\% \text{ of Stocked Reparables} = \frac{363,347}{363,347 + 77,997} \times 100 = 82.3\%$$

The percentage of Nonstocked Reparables is determined as follows:

$$\% \text{ of Nonstocked Reparables} = \frac{9,679}{9,679 + 61,487} \times 100 = 13.6\%$$

Applying these percentages to the stocked and nonstocked totals of principal end items and reparables in Table D-1 generates the following:

$$400,272 \times 82.3\% = 329,424 \text{ stocked reparables}$$

$$48,981 \times 13.6\% = 6,661 \text{ nonstocked reparables}$$

Hence, the numbers of secondary items managed in the DoD are:

Stocked	2,998,274
Nonstocked	614,643
Total	3,612,917

C. NUMBER OF ITEMS HAVING HIGH PRIORITY REQUIREMENTS

1. MILSTEP Reports. The MILSTEP Supply Availability and Workload Analysis Report Ledger (SAWA Report) provides information separately for Issue Priority Group (IPG) I requisitions and for Stocked and Nonstocked items. These Reports for the third quarter Fiscal Year 1977 were used to make the following determinations.

2. Stocked Items. From Line 4 of the MILSTEP Supply Availability and Workload Analysis Report Ledger (SAWA Report), IPG I demands represented 15.1% of the total demands for stocked items DoD-wide for the third quarter of Fiscal Year 1977. From Line 12 of the SAWA Report, the number of stocked items in zero balance with materiel obligations outstanding at the end of the third quarter of Fiscal Year 1977 was 66,859. Applying the percentage to the number of items yields:

$$15.1\% \text{ of } 66,859 = 10,096 \text{ items}$$

This number represents the number of stocked items in zero balance having IPG I materiel obligations outstanding.

3. Nonstocked Items. Again from Line 4 of the SAWA Report, IPG I demands represented 7.3% of the total demands for nonstocked items DoD-wide for the third quarter of Fiscal Year 1977. Applying this percentage to the number of nonstocked items developed yields:

$$7.3\% \text{ of } 614,643 = 44,869 \text{ items}$$

All nonstocked items were used in this calculation because (1) they are likely to be at zero balance at the wholesale level by virtue of their "nonstock" classification and (2) MILSTEP data does not identify nonstocked items in zero balance and having IPG I materiel obligations outstanding. As a result, this approach represents a worst case situation for nonstocked items. The actual number of such items with IPG I requirements is likely to be significantly smaller.

D. PRIORITY DESIGNATORS WITHIN IPG

Defense Automatic Addressing System (DAAS) data for August 1977 showed the Redistribution of Priority Designators within IPG I to be as follows:

<u>PD</u>	<u>Number</u>	<u>%</u>
01	844	0.3
02	147,449	58.9
03	102,165	40.8
IPG I	250,458	100.0

E. NUMBER OF CRITICAL ITEMS

1. Application of Percentages. Because DAAS data could not, without extensive research and/or programming, provide data separately for stocked and nonstocked items, the single set of percentages developed above were applied to the stocked and nonstocked item data as indicated below.

2. Stocked Items. Applying each of the percentages listed in paragraph D to the number of stocked items in zero balance with IPG I materiel obligations outstanding developed in paragraph C yields:

a. Number of stocked items in zero balance with Priority Designator (PD) 01 materiel obligations outstanding:

0.3% of 10,096 items = 30 items

b. Number of stocked items in zero balance with PD 02 materiel obligations outstanding:

58.9% of 10,096 items = 5,947 items

c. Number of stocked items in zero balance with PD 03 materiel obligations outstanding:

40.8% of 10,096 items = 4,119 items

3. Nonstocked Items. Applying each of the percentages listed in paragraph D to the number of nonstocked items with IPG I materiel obligations outstanding developed in paragraph C yields:

a. Number of nonstocked items in zero balance with PD 01 materiel obligations outstanding:

0.3% of 44,869 items = 135 items

b. Number of nonstocked items in zero balance with PD 02 materiel obligations outstanding:

58.9% of 44,869 items = 26,427 items

c. Number of nonstocked items in zero balance with PD 03 materiel obligations outstanding:

40.8% of 44,869 items = 18,307 items

Table D-2 summarizes the results of these calculations:

Table D-2

ESTIMATED NUMBER OF ITEMS
WITH IPG I REQUIREMENTS AND ZERO
BALANCE AS OF 30 JUNE 1977

Priority	Items With Zero Balance		
	Stocked	Nonstocked	Total
01	30	135	165
02	5,947	26,427	32,374
03	4,119	18,307	22,426
IPG I	10,096	44,869 ^{1/}	54,965

Source: Analysis

^{1/} The estimate for nonstocked items is a worst case estimate. The actual number of nonstocked critical items will probably be significantly smaller.